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ABSTRACT

The purpose of this hearing was to get a sense of the larger picture of what educational television is currently doing, what the alternative modes for educational television are, the merits of the programming that is currently available, what the documented educational impact in schools that have used educational TV has been, the types of policy concerns that exist, how the Federal Government might help educators attend to the needs of students of all ages, and the direction for educational technology in the classroom in the next decade. A topic of particular concern was public school participation in "Channel One," a news and public affairs program that includes commercials, and involves the donation of equipment to schools with the proviso that a specified percentage of students watch the program at the same time everyday without interruptions. Following the opening statement by Jeff Bingaman, Senator from New Mexico, prepared statements were presented by: (1) Linda G. Roberts, Senior Associate of the Science Education and Transportation Program, Office of Technology Assessment; (2) Laura Eshbaugh, Vice Chairman of Whittle Communications, Knoxville, Tennessee; (3) Gary R. Rowe, Senior Vice President, Turner Educational Services, Atlanta, Georgia; (4) Sandra H. Welch, Executive Vice President, Education Services, Public Broadcasting Service, Alexandria, Virginia; (5) Frank Mankiewicz, Vice Chairman, Hill and Knowlton Public Affairs Worldwide, Washington, D.C.; (6) Gary Tydings, Executive Director, Professional Engineering Development and Instructional Television, University of New Mexico, Albuquerque; (7) Claiborne Pell, Senator from Rhode Island; and (8) Bill Honig, State Superintendent of Public Instruction for California. (DB)

IR

S. HRG. 102-242

CHANNEL ONE: EDUCATIONAL TELEVISION AND TECHNOLOGY

ED341374

HEARING

BEFORE THE

SUBCOMMITTEE ON EDUCATION, ARTS, AND HUMANITIES

OF THE

COMMITTEE ON LABOR AND HUMAN RESOURCES

UNITED STATES SENATE

ONE HUNDRED SECOND CONGRESS

FIRST SESSION

ON

EXAMINING CURRENT EDUCATIONAL TELEVISION PROGRAMMING AND TO EXAMINE NEW TECHNOLOGIES WHICH COULD IMPACT THE FUTURE OF EDUCATIONAL TELEVISION, FOCUSING ON CHANNEL ONE, A NEWS AND INFORMATION PROGRAM DESIGNED FOR A TEENAGE AUDIENCE

JULY 26, 1991

Printed for the use of the Committee on Labor and Human Resources

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CHANNEL ONE: EDUCATIONAL TELEVISION AND TECHNOLOGY

FRIDAY, JULY 26, 1991

U.S. SENATE,
SUBCOMMITTEE ON EDUCATION, ARTS, AND HUMANITIES,
COMMITTEE ON LABOR AND HUMAN RESOURCES,
Washington, DC.

The subcommittee met, pursuant to notice, at 9 a.m., in room SD-430, Dirksen Senate Office Building, Senator Jeff Bingaman, presiding.

Present: Senators Metzenbaum and Bingaman.

OPENING STATEMENT OF SENATOR BINGAMAN

Senator BINGAMAN. We'll call the subcommittee to order.

The Senate was in session until about midnight last night, so I think we'll probably be a little slow in getting started. I don't know if other Senators will be here or not as we proceed, but why don't we go ahead.

Educational TV is entering more and more into the curriculum of our schools, and it is clear that this trend is not going to reverse itself. It obviously can be an effective tool if made a part of the curriculum, an effective tool to motivate students to learn. It is a tool that creative and dynamic teachers can use to supplement the curriculum.

It can also be abused, particularly when one considers that most classroom periods are no longer than 45 or 50 minutes in length and that teachers will have to be thoughtful in how to integrate it into the curriculum given the very heavy demands that they already have on that curriculum.

Educational TV also has the potential to help us restructure education. We have an incredible infrastructure of educational technology that has been developed since the Sixties that has not been harnessed into a common direction or vision of what educational technology can do to transform the way that teachers teach and students learn and the way the curriculum is implemented.

What I believe is needed is a national debate to determine a course of action to pull together some of these educational technologies that exist and are being developed. It is my hope that this hearing will be a part of that national debate. We need to try to have a broad-based policy agreement about the overriding direction that educational technology should take in the United States in the next decade.

There has been a lot of excitement and enthusiasm and interest in using educational technology. As I am sure you are all aware, many questions and issues have arisen. There are questions with respect to Channel One, which has been the most successful and most broadly disseminated commercial activity of this type. There are issues of State and local decisionmaking, teacher empowerment versus centralized control, the private sector versus the public sector and taxpayers versus school spendthrifts. The purpose of this hearing is to get a sense of the larger picture what is educational TV currently doing, what are the alternative modes for educational television, what is the merit of the programming that is available today, what has been the documented educational impact in schools that have used educational TV? What types of policy concerns exist and how might the Federal Government help educational attend to the needs of students of all ages? What will be the direction for educational technology in the classroom in the next decade?

These are the types of questions that I hope we can explore today. Clearly, we know there will have to be a major investment in facilities and in technology in order to take advantage of what is available. We have many questions about who controls the curriculum, how to see to it that this technology is used effectively. These are all questions that need to be addressed as part of this larger debate.

We have some excellent witnesses here to do that today. We have six people here to testify today, and I thought we would start with Dr. Linda Roberts, who is the senior associate for science, education and transportation program at the Office of Technology Assessment here with the Congress.

Dr. Roberts, we'll hear from you first, and then we'll go to a second and then a third panel.

STATEMENT OF LINDA G. ROBERTS, SENIOR ASSOCIATE, SCIENCE, EDUCATION AND TRANSPORTATION PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT, UNITED STATES CONGRESS, WASHINGTON, DC

Ms. ROBERTS. Mr. Chairman, I am pleased to have the opportunity to provide testimony on this hearing on Channel One, educational television and distance learning technology. With your permission, I would like to submit my written statement for the record and take this time to highlight several key points.

Senator BINGAMAN. That's fine. Just for the information of the witnesses, we'll include all full statements in the record, and I would appreciate it if people would summarize their main points as best they can.

Ms. ROBERTS. Thank you.

OTA's report, "Linking for Learning"—which you have a copy of, and which I am gratified to know has been so useful to you—really gives us a sense of the large picture of educational television and technologies today. What we find is that distance learning technologies are bringing new resources to students, breaking down the four walls of the classroom and creating new communities of learners.

Five years ago, few States or districts had projects, plans or even knowledge of distance learning education at the K-12 level; yet today, every State and many districts have projects that are up and running.

The reason is twofold, and I think that we must pay, as you pointed out, careful attention to why we have so much interest in distance learning. First of all, important educational needs can be met with these technologies, and the technologies themselves are becoming more accessible and less costly.

The point I'd like to emphasize more than any for this hearing is that distance learning today is diverse. I'd like to draw your attention to Figure 1. When we look at what is being delivered, how it is being delivered, what technologies are being used, who is being served, we see a wide range of options that give schools many choices. And many are involved in shaping and defining and delivering distance learning. These include the local school districts themselves, regional education service agencies, our State educational agencies, our universities and community colleges, our public television stations, museums and science centers, even Federal agencies, and as your hearing will point out today, the private sector as well.

But within the last 5 years, the principal application of K-12 distance learning has been to provide high school courses in advanced subjects, especially where such courses are not available because there are too few students, or a lack of qualified teachers. An increasing number of efforts, however, go beyond courses and offer modules and enrichment activities for classroom instruction, whether they be electronic field trips or visits with distance scholars, scientists and some of the Nation's heroes.

And if we look at the technology that is in use, what we see is that we have had many advances that have made it possible to expand our learning opportunities and to expand access to educational resources.

It is important to note that some of these technologies, like cable and educational television, are not new, but others, like fiber optic systems and satellites, are. But whatever form of technology is utilized, recent developments have resulted in systems that are powerful, flexible, and increasingly affordable.

But there are issues and concerns. Despite the explosive growth of distance learning in K-12 education, we have to be concerned about access, about effectiveness, as you mentioned in your opening comments, about who is in control, and in particular about teachers' involvement.

Access to the resources that I am talking about varies nationwide. The majority of teachers and students have yet to realize the benefits that distance learning can provide. And access to distance learning resources requires technologies and support on many levels. A dish on a roof, or cable to the door of the school, is only the very beginning, and as some districts have discovered, really making the technology effective and adaptable and usable requires considerably more investment, not only in terms of equipment and wiring and resources, but even more importantly, in terms of involving teachers and thinking about curricula and shaping curricula to be effective learning opportunities.

In most instances, distance learning appears to be as effective as face-to-face classroom instruction, and learner achievement has been the primary question in research evaluations of distance learning. Studies in Minnesota and Iowa and elsewhere show that student test scores, grades, and levels of participation are comparable.

But to be effective, courses and enrichment activities must involve students in the learning process and be connected to the curriculum and other classroom activities.

Whether distance learning works well for all students is yet to be determined, and more research is needed.

Finally, as I mentioned before, teachers are very important. Whether they are the distance learning teachers themselves or the users of these resources, teachers must have training, preparation and institutional support to successfully teach with distance learning technologies. And their concern about the quality of instruction must be taken into consideration in shaping distance learning efforts.

Much of the attention on distance learning has focused on the power of the technology to improve student learning in today's classrooms. At least equally powerful and promising is the potential for technology to improve teaching. The system that brings resources to students brings resources to their teachers. I can cite numerous examples from the Montana Big Sky Network, which links 140 of the State's rural one-room schools to really extend teachers' knowledge about curricula and classroom activities, to the efforts that several of the State education agencies embarked on last year to help teachers understand what restructuring was all about, and to do this, a series of national teleconferences involved resources from all over the country, including the public television stations who were partners in this effort.

So there is a lot that we are already doing, but there is much more that we could be doing in this area.

As we look to the future—and in conclusion, because I want my remarks to be short enough so that you have time to ask questions—it is very clear that educational needs must drive the selection, the development and the use of distance learning. Now and in the future, it will be important to support local choice and build on available resources. A striking characteristic of distance learning today is its diversity. Many different technologies are in use; services involve different institutions, agencies, and the private sector; and programs are designed to meet a variety of objectives.

There is no best technology nor is there a single best approach to distance learning. A combination of Federal, State, local and private efforts will be needed to exploit fully the full range of distance learning resources. The key to future development is flexibility, capacity to expand, ability to connect with other systems, and applications that respond to educational needs.

Thank you, Mr. Chairman.

[The prepared statement of Ms. Roberts follows:]

PREPARED STATEMENT OF LINDA G. ROBERTS

Mr. Chairman, I am pleased to have the opportunity to provide testimony for this hearing on Channel One, Educational Television, and Technology. Channel One is

one of many efforts to use telecommunications technology to bring new resources to America's classrooms. Along with other satellite, cable, microwave, and fiber optic systems, these efforts comprise the growing phenomenon of "distance education." As requested, I will provide an overview of distance learning technology and applications in K-12 schools, identify key issues and concerns about distance learning, and outline issues for future development and national policy.

My comments today draw on OTA's assessment of distance learning, which was requested by this Committee. That report, *Linking for Learning: A New Course for Education* [1] has received wide attention in Congress, in Federal agencies, and at the State and local level. The accompanying video report has been used by hundreds of educators seeking guidance on innovative telecommunications applications for education.

Distance Education in Today's Classrooms

If we took a peek at distance learning in today's classrooms, what would we see? We could join students taking a Russian class taught in Columbia, South Carolina, a Japanese course in Lincoln, Nebraska, a World Geography Honors class in Tuscaloosa, Alabama, or a Physics class in Lexington, Kentucky.[2] All across the country there are classes similar to these, electronically linking students and teachers as far as a continent away or as close as across town. Students may be working on a common science experiment with hundreds of sites across the country and sharing their data over a computer network. On another day, students are traveling via satellite to the Boston Museum of Science to speak with a visiting Russian astronaut. Others may be reading a formula on the chalkboard in a classroom far from their own, or discussing poetry with a Pulitzer Prize winning author in London. And still others may be watching programming specifically designed to bring daily news or keep in touch with politics, world events, and issues that affect their daily lives.

All of these are examples of what is commonly known as distance learning. In these applications, technology transports information, not people. Distance learning technologies are bringing new resources to students, breaking down the four walls of the classroom, and creating new communities of learners. The variety of formats, degree of interaction, and types of programming offer many choices (see figure 1). Today's distance learning activities include live, two-way interactions to link teachers and students at different locations; programming that is live with limited or no interaction; computer conferencing with interaction on a delayed basis; current events and other broadcast programming; and recorded materials.

Distance learning in today's classrooms is diverse and growing. Five years ago few States or districts had projects, plans, or even knowledge of distance education at the K-12 level; today every State and many districts have projects up and running. The reason is twofold: important educational needs can be met with this technology, and the technology itself is becoming more accessible and less costly.

Local efforts, statewide initiatives, projects supported by the telecommunications industry, the Star Schools Program, and other Federal programs have all contributed to this growth. Today's distance learning involves many players and new relationships. Providers include:

- local school districts,
- regional education service agencies,
- State education agencies,
- colleges, universities, and community colleges,
- public television stations,
- museums and science centers,
- Federal agencies,
- private sector (satellite, cable, telephone companies), and
- consortia of the above.

Connecticut's distance learning efforts have involved a partnership between the schools, the State education agency, and the telephone company. In Cedar Rapids, Iowa, the Kirkwood Community College offered its system and expertise to the local district. The local telephone cooperatives in the Oklahoma Panhandle worked with four school districts to develop a state-of-the-art fiber optic television network. In other locations, cable operators are working with districts to link classrooms or expand access to a variety of distance learning resources. Another company, Whittle

[1] U.S. Congress, Office of Technology Assessment, *Linking for Learning: A New Course for Education* (Washington DC: U.S. Government Printing Office, November 1989).

[2] These courses and others were offered by the SERC project, one of the multistate consortias funded by the Federal Star Schools program.

Communications, offers subscribing schools both programming and equipment (a satellite dish, television sets, and other requisite equipment) free of charge, but requires that students view a daily news program that includes 2 minutes of commercials.[3] And in a unique partnership involving museums, schools, a research laboratory, private industry, and the Federal Government, students joined Dr. Robert Ballard, the prominent marine geologist and discoverer of the Titanic, as he conducted undersea research last year on the floor of the Mediterranean Sea and in the Great Lakes.

Within the last 5 years, the principal application of distance learning in K-12 education has been providing high school courses in advanced subjects, especially where such courses are not available because of too few students or a lack of qualified teachers. For these students, distance learning is the only way that they can study advanced Russian or Spanish, calculus or astronomy, art history or philosophy, psychology or economics, electronics or advanced placement courses (see table 1). An increasing number of efforts, however, go beyond courses and offer modules and enrichment activities for classroom instruction, electronic field trips and visits with distant scholars, scientists, and heroes. One of the most valuable applications has been for staff development and inservice training for teachers and administrators.

Advances in information and telecommunications technology have made possible these rapidly expanding learning opportunities and access to educational resources outside the classroom. Some of these technologies, like cable and educational television, Instructional Television Fixed Service (ITFS), and microwave broadcasts, have been around for years. Others, like fiber optics and satellite, are newer. But whatever form of technology is utilized, recent developments have resulted in systems that are powerful, flexible, and increasingly affordable. Most distance learning systems are hybrids, combining several technologies to provide increased flexibility to meet local needs. Maine's telecommunications network, for example, operates with a hybrid of microwave, ITFS, and fiber optic transmission linkages. There is no one best technology for all applications (see table 2).

Key Issues and Concerns

Access to Distance Learning Resources: Despite the explosive growth of distance learning in K-12 education, access to these resources varies nationwide. The majority of teachers and students have yet to realize the benefits that distance learning can provide. Access to cable, satellite, electronic networks, and even the more traditional forms of educational television programming varies considerably across the Nation. In 1989, OTA estimated that 30 percent of rural and isolated high schools would have a satellite dish by the end of 1990; of that number, approximately one-third were expected to be purchased and installed using Star Schools money.[4] In a recent sample of 35,000 schools and 3,500 school districts, enrolling some 20 million students (one-half of the total enrollment in K-12 public schools), 64 percent of the schools reported using cable television.[5]

Access to distance learning resources requires technologies and support on many levels. For example, even though the Dallas Independent School District (DISD) had negotiated educational use of the local cable system and a connection to each school, individual classrooms were not linked. To wire all the classrooms in DISD school buildings and provide access to cable television, telephone, and computer services DISD spent $3.8 million.[6] In other instances, statewide efforts, regional consortia, and partnerships with industry have made it possible to expand access to distant but needed resources. A number of schools have signed onto the Whittle Channel One effort because this is the only way they can begin to tap into distance learning resources.

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[3] The admission of advertising in public schools has generated a great deal of controversy and some states have barred districts from participating in this program. Despite this controversy, Whittle officials indicate that 10,416 schools in 47 States have subscribed to the network and 9,000 schools will be on line in the Fall of 1991. "The rest will be on a waiting list pending our decision to invest in additional hardware." David Jarrard, Manager of Governmental Relations, Whittle Communications, personal communication, July 18,1991.

[4] Office of Technology Assessment, op. cit., footnote 1, p. 140.

[5] The study by Market Data Retrieval of Shelton, CT, also reported that channels most identified by responding districts are CNN, The Discovery Channel, and PBS. Nelson B. Heller and Associates, *The Heller Report on Educational Technology and Telecommunications Markets*, vol. II, No. 9 (Northbrook, IL: June 1991).

[6] Office of Technology Assessment, op. cit., footnote 1, p. 71.

Effectiveness

In most instances, distance learning appears to be as effective as face-to-face instruction in the classroom. While not as extensive as the evaluation of distance learning in industry, the military, and higher education, research to date conducted by Star Schools projects and others has provided much useful information on K-12 applications.

Learner achievement is the primary question about distance learning: "Do the students learn as much through distance learning as their counterparts in traditional classrooms?" Studies in Minnesota, Iowa, and elsewhere show that student test scores, grades, and level of participation are comparable. To be effective, courses or enrichment activities must involve students in the learning process and be connected to the curriculum and other classroom activities.[7] Students and teachers participating in the Jason Project (an opportunity to follow the undersea explorations of oceanographer Robert Ballard) spend weeks preparing for the "live, two-way" research event.

Students report that they must work harder in courses offered at a distance but they welcome the increased course options, responsibility for their own learning, and the opportunity to expand their community. Whether distance learning works well for all students is yet to be determined, and more research is needed.

We have seen a few exciting examples of using these resources to reach out to those with special needs. For example, in the Pennsylvania Telelearning Project, audiographics technology (a two-way computer/voice system) linked a student too sick to attend school with his classmates and teachers. In this same project, the technology allows students in a correctional institution to take calculus from the local high school, electronically allowing them to work alongside the town kids. Some school systems are beginning to reach the home, through homework hot lines and special activities for parents over community cable channels and telephone voice-mail connections. OTA's current work is examining how distance learning and other technologies can reach functionally illiterate adults and those with limited English proficiency.[8]

Support for Teachers

Whether they are the distance learning teachers, or users of these resources, teachers must have training, preparation, and institutional support to successfully teach with distance learning technologies, as indeed they must have for all educational technologies. Also, their concerns about technology and the quality of instruction must be taken into consideration in planning distance learning efforts. Teacher input not only shapes development, it assures long-term commitment.

Much attention has focused on the power of technology to improve student learning in today's classrooms. At least equally powerful and promising is the potential for technology to improve teaching. The system that brings resources to students brings resources to their teachers. Distance learning not only provides tools for teaching, but also a means to train, support, assist, motivate, and connect teachers in the classroom. As in the program in Hartford, Connecticut, teachers can team teach with colleagues across town or across the country. They can discuss problems and share ideas over an electronic network like Montana's Big Sky Telegraph, which links all of the one room schools in the State with one another and with Western Montana University. Teachers can observe master teachers in action, participate in professional meetings and courses, earn advanced degrees—all without leaving their home school.

Looking to the Future

Educational needs must drive selection, development, and use of distance learning. Now and in the future, it will be important to support local choice and build on available resources. A striking characteristic of distance learning today is its diversity. Many different technologies are in use, services involve different institutions, agencies, and the private sector, and programs are designed to meet a variety of objectives. There is no best technology; nor is there a single best approach to distance learning. As we have seen; Channel One is one of many options for local districts to consider.

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[7] A recent study of the effects of current events programming offered by Channel One and the CNN Newsroom demonstrated that student knowledge of current events was much higher when the viewing of these programs was integrated into the curriculum and instruction offered by teachers. See "Technology News," *Educational Technology*, June 1991, vol. 31, No. 6, p. 61.

[8] The study on Technologies for Literacy was requested by the House Committee on Education and Labor and the Senate Committee on Labor and Human Resources.

A combination of Federal, State, local, and private efforts will be needed to exploit the full range of distance learning resources. The key to future development is flexibility, capacity to expand, and ability to connect with other systems.

Dissemination of information about approaches, available resources, and new technology, coupled with research that evaluates ongoing projects (particularly those that reach new groups of students and offer new areas for study), can further delineate benefits, costs, and impacts on students, teachers, and institutions. Research can help us understand the social and cognitive factors that affect the learning process. There are many questions to be explored: How much interactivity is essential for learning? How can "distant" teaching be extended and supplemented by classroom activities? How do computers, interactive video, and fax machines provide tools for learning? How can this technology be harnessed to best serve the needs of American education?

The current emphasis on mathematics, science, foreign language, and current events has generated a variety of needed programs. It may be time to encourage development in other areas of critical need as well. For example, many schools have a great need for resources to help students with limited English proficiency. Others are seeking ways to help students develop critical thinking skills in cross-disciplinary courses. Teachers are experimenting with new methods of measuring student learning via performance assessment. Distance learning could bring state-of-the-art developments in curriculum and assessment to teachers in other locations.

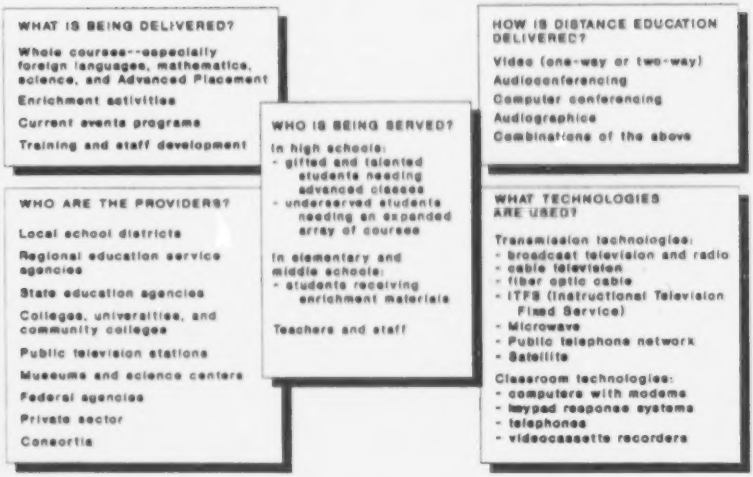
We believe that it would be valuable to encourage projects that target nonschool learner populations, including homebound and disabled students, and youngsters in detention centers and prisons. Systems that serve schools could extend their reach to the community; parent education, adult education, and other activities could be expanded. These applications extend the use of resources to after school hours and help assure long-term support of efforts.

National leadership could expand distance learning to communities without resources and extend the reach of installed systems. Congress could specify expenditures for distance education in current Federal programs or make funds directly available through a new program. In previous testimony, OTA recommended that the Star Schools Assistance Program be dynamic, open-ended, and focused on results.[9] Encouraging responsiveness to advancing technologies, addressing educational needs, and encouraging the expansion of services and objectives are all to be desired in this program as in any other that Congress might wish to support.

[9] Nancy Carson, Office of Technology Assessment, "Distance Education: Current Status and Future Directions," testimony at hearings before the Committee on Labor and Human Resources, United States Senate, April 24,1991.

Figure 1

Distance Learning in Today's Classrooms



SOURCE: U.S. Congress, Office of Technology Assessment, Linking for Learning: A New Course for Education (Washington, DC: November 1989), report brief.

Table 1

Whole Courses Offered in the United States in 1988-89 by Selected Distance Learning Projects[a]

Foreign languages (119)[b]	Mathematics and science (110)	Humanities (69)	Political science and history (19)	Business and economics (16)	Vocational education (9)	Social studies (8)
Spanish (38)	Calculus (17)	English (28)	History (11)	Accounting (8)	Shorthand (7)	Social studies (4)
French (26)	Mathematics (12)	Art/art history (7)	Law (5)	Economics (7)	Electronics (1)	Geography (2)
German (26)	Psychology/ sociology (12)	Composition (7)	Government/ politics (3)	Sales/marketing (1)	Home economics (1)	American studies (1)
Latin (12)	Science (11)	Literature (7)				Chinese culture (1)
Japanese (5)	Physics (9)	Communications (4)				
Greek (4)	Computers (6)	Humanities (4)				
Russian (4)	Trigonometry (6)	Education (3)				
Chinese (3)	Algebra (5)	Journalism/media (3)				
Italian (1)	Astronomy (4)	Theater arts (3)				
	Pre calculus (4)	Music (2)				
	Statistics (4)	Philosophy (1)				
	Chemistry (3)					
	Health (3)					
	Technology (3)					
	Geology (2)					
	Anatomy (1)					
	Biology (1)					
	Biomedics (1)					
	Anthropology (1)					
	Elementary analysis (1)					
	Entomology (1)					
	Fish and wildlife (1)					
	Marine science (1)					
	Physical science (1)					

[a] This table represents the total number of courses offered in the subject listed in the distance learning projects in Appendix A. Note that these classes are not of equal size; each class could have from 12 to 1,200 students in it.

[b] Numbers that appear in parenthesis represent the total number of courses offered under a general subject heading.

SOURCE: U.S. Congress, Office of Technology Assessment, Linking for Learning: A New Course for Education, OTA-SET-430 (Washington, DC: U.S. Government Printing Office, November 1989), tb. 2-2, p. 32.

Table 2

Transmission Technologies for Learning at a Distance

Technology[a]	Configuration	Advantages	Disadvantages	Trends
Terrestrial broadcast	One-way broadcast of audio, video, and possibly data; possible audio return	No special receiving equipment or converters; reaches most schools and homes	Limited channels and air time; reception limited by geography; high transmission equipment and production costs	Increased use of data/text transmission
Fiber optic	Two way audio, data, and video	High capacity/speed; channel capacity easily expandable; high quality signal	High installation cost; rights of way may be required to lay new cable	Costs are declining rapidly; fiber deployment is expanding rapidly
Microwave	Two way point to point audio, data, and video	Low cost transmission time, no rights of way needed	Must be FCC licensed; tower space or location may be difficult to get; difficult and costly to expand channels; crowded frequencies; line of sight required	Use of higher frequencies is expanding
Instructional Television Fixed Service (ITFS)	One way broadcast or point to point audio, data, and video; possibility of audio return	Low cost delivery of video	Crowded frequencies, especially in cities; FCC licensing required; limited transmission range; line of sight required	Digitalization may triple channel capacity; wider coverage areas using repeaters; rebroadcast of satellite delivered programming
Public Switched Telephone Network (PSTN)	Two way voice, limited data and video	Wide coverage, low initial cost; high quality and capacity of fiber optic links, others handle repair and upgrades	Quality is spotty; limited transmission of data and video; cost is distance sensitive	Expanding fiber installation; digitalization of network increasing; increasing intelligence in the network
Satellite	One way broadcast of voice, data, and video; possibility of audio and data return	Wide coverage transmission cost is distance insensitive	Expensive uplinks; high transmission costs; FCC licensing of uplinks; receive site microwave interference (C band) or rain fade (Ku band)	More use of Ku band; possible transponder shortage; increased use of data; increased interactive capabilities
Audiographics	Two way computer conferencing with audio interaction	Low cost, easy exchange of graphics; uses PSTN	Visual interaction limited to graphics/still video	More powerful computers, better software and peripherals increase capabilities
Cable television systems	One way broadcast or two way point to point audio, data, and video	Wide availability; low delivery costs	Limited capacity; can be difficult to interconnect; not usually designed for interactivity	Capacity increases using fiber; more addressability and two way capability

[a]Technology systems do not have to operate independently; they are often combined in "hybrid" systems.

SOURCE: U.S. Congress, Office of Technology Assessment, Linking for Learning: A New Course for Education, OTA-SET-430 (Washington, DC: U.S. Government Printing Office, November 1989), tb. 3-1, p. 61.

Senator BINGAMAN. Thank you very much. In some ways, I think we should have had you as the last witness so I would have more thoughtful questions here.

Ms. ROBERTS. We are used to being last.

Senator BINGAMAN. Let me ask one question that has occurred to me. It seems as though the proliferation of educational TV through the Channel One effort and perhaps others is really a national phenomenon; it is occurring as a national activity.

It strikes me that there does not seem to be any national governmental involvement in regulation or oversight or in any particular aspect of this. I mean, we sort of have a national activity going on with the Federal Government totally inactive on the subject. Am I missing something? Is there more going on than I am aware of at the Federal level?

Ms. ROBERTS. I think that is a very interesting question. If we look at technology more generally—all of the technology, whether we are talking about computers or television—it has very much been a grassroots development in this country, unlike what has occurred in places like France or even Great Britain. In this country, the application or, if you will, the bringing of technology into our schools has started at the bottom, not at the top. And while, as we point out in both the "Power On" report, which was the look at computer education and the applications of computers in schools, and in the distance learning report, while Federal programs, Federal dollars, have been an important resource for acquiring hardware and software and access to other programming, you are quite right—there hasn't been a national agenda to either introduce technology in the schools or to outline what the key goals and objectives would be.

Senator BINGAMAN. Is there any office in the Department of Education that has this as its responsibility and is trying to do anything in this area?

Mr. Roberts. When we looked at educational technology programs in the Federal Government, we found that there were efforts in various parts of both the Department of Education and the National Science Foundation, for example; but in most cases, they were fairly discrete activities.

If you go back in the history of educational television support——

Senator BINGAMAN. By "discrete" you mean minimal; right?

Mr. Roberts. Well, yes, yes, in fact that's true. There was an office of educational technology in the Department of Education, but when all of the discretionary programs were consolidated into Chapter II, that was one of the areas that became part of the consolidation.

When the Department of Education was funding "Sesame Street", for example, and a series of programs that were called "ESA"—I can't remember now what they were aimed at, but I know they were a fairly extensive effort to create programming for multicultural learning—there was a separate unit in the department.

Now, in the office of special education, there is a separate program area that funds technology for special education, but that is an exception to the rule.

Senator BINGAMAN. How does the Star Schools program fit into this larger picture?

Ms. ROBERTS. I would count that as one of the programs when I say there are programs in the department. Particularly in the more recent history, Star Schools is one of the efforts that has certainly contributed to both availability of resources for students and schools, but more importantly it did present an opportunity for school districts and State education agencies and telecommunications providers to come together for the purpose of proposing distance learning activities. And as we pointed out in "Linking for Learning", even though only four major projects were funded in the first go around, and an additional four projects were funded in the second round of funding, the Star Schools legislation did send a signal to the education community that essentially said Congress thinks that distance learning resources ought to be utilized, and they ought to be utilized to address some of our most critical needs, those being science and foreign language instruction.

Senator BINGAMAN. As I understand the Star Schools program—and I don't understand it well, but to the extent I do—it really tries to implement an interactive kind of learning, so that you've got a local teacher, but you also have someone who can be called, and there can be interaction during the time that the instruction is provided. Is that accurate?

Ms. ROBERTS. That is correct.

Senator BINGAMAN. Now, that's very different from educational TV as Channel One is performing it, or as CNN or others, in a commercial sense are doing it, I gather.

Ms. ROBERTS. Well, I think you really have to look at the use of the technologies, not only in terms of what we are doing right now, but what could easily occur tomorrow or the next year or 5 years from now. And when we looked at what we call distance learning, while we focused in on the opportunities for interaction, some form of interaction, two-wayness, if you will, whether it is one-way broadcast with video and two-way connections through a telephone line or a computer network, whatever, it is clearly that what you can do with one-way broadcast can easily be enhanced with the other technologies very rapidly.

So if you take, for example, either the CNN Newsroom or the Whittle Channel One activities, it would not be impossible to extend those activities, for example, to have call-ins, to have students ask questions about the news, or to have activities that follow the news that might engage students in some very serious discussions about critical world issues.

I refer to research in my testimony that makes the point that whatever program we are talking about, if there is no connection, if it is just what I would call a one-shot broadcast—you are getting it, and that's it, you've watched it for 10 minutes, and then you go on to other things—if there is no connection to whatever else it is that students are concerned about, or need to learn about in the classroom, the effect on learning, what students really learn, is minimal.

So it relates back again to how you think about the learning process and what you want to do in the big picture.

Senator BINGAMAN. Could you give me a little description of what the National Science Foundation is doing? I continue to hear references to the fact that they have an effort in this regard, and I don't know what it is. I don't know if they produce videos and send them out, or if they broadcast programs, or what they do.

Ms. ROBERTS. Well, I don't know all of that. I really shouldn't answer for NSF, but I will tell you what we are aware of. NSF has funded with the Department of Education several efforts to build programming, educational television programming. They have been funders of the Children's Television Workshop math series and the science series, as one example. But within NSF, there has been growing interest in using technology as a tool for learning in science and mathematics. So there have been a number of projects that have not been on what I would call the distance learning side, but they relate back in because they are tools that can be used in classrooms, including a lot of computer software development. And more recently, NSF has gotten very interested in ways in which telecommunications technologies can enable students to do science more effectively. So for example they have funded a number of projects that involve students collecting scientific data and then sharing that data with scientists and other experts over an electronic network.

I don't know what they are planning to do in the future, but I know in fact that this is an area of great interest for them.

Senator BINGAMAN. I guess to try to bring the question down to concrete circumstances, if I were a high school biology teacher, and I wanted to enrich the curriculum with the use of educational TV, what resources could I get out of the National Science Foundation? Could I get particular programs that I could show students as we went through the textbook, or is there software available that is of a learning type that I could get copies of, or what is available?

Ms. ROBERTS. I think it is not that direct a connection. The work that NSF has funded has in some cases led to the development of products that are now available, commercially or in what I would call a nonprofit sector.

I mentioned the NSF KidsNet project. It is now possible for a science teacher to have his students engaged in a study, for example, of radon or trash in the environment, and do this through acquiring, purchasing, materials that are now sold by the National Geographic Society. And the reason they are sold by the National Geographic Society is because NGS was a partner in this NSF-funded project.

I was more prepared to answer the question not just from what NSF has funded, but more generally, what is available or what could be available to a science teacher.

Senator BINGAMAN. Well, answer that question, then.

Ms. ROBERTS. The answer is an awful lot. And back to your question about educational television, there are an incredible array of programs that are shown on our public broadcasting system.

Senator BINGAMAN. How does that high school biology teacher find out about them?

Ms. ROBERTS. Well, it requires in many cases a lot of initiative on the part of the teacher. In many cases, to my knowledge, what teachers do is they tape it off the air, and they tape it on their own

time, or they get somebody in their district—a media coordinator, perhaps—to tape it, and then they show it in the classroom, or they show excerpts in the classroom.

There is now another opportunity through cable to take programming off the Discovery Channel, which teachers are encouraged to do, and there are a whole host of programs there that are available.

So at a very minimum what the Federal Government could do is to publish a regularly updated catalog of what is available in the way of educational resources or educational technology for classroom teachers.

Ms. ROBERTS. It could do that, or it could provide incentives for someone else to do that.

Senator BINGAMAN. Is anybody doing that?

Ms. ROBERTS. There are a number of efforts out there. Some of them are at the State level. Some States, for example, like South Carolina, have a very extensive technical assistance arm through their educational television activities, and they publish monthly newsletters. So does, for example, the public television station in San Francisco. There must be hundreds of these that give information about programming that is available.

There is another group that purports to have an extensive database of many of the educational television programs that can utilize its resources. My understanding is that the Cable Alliance group, called Cable Alliance for Education, provides information to schools about resources that are available over cable networks.

So there is a lot of information out there, but you know, it is easy for me to say that, because I have time to——

Senator BINGAMAN. Yes, you are at this hearing; there may be a lot of these high school biology teachers who couldn't come this morning.

Ms. ROBERTS. I really want to make the point that teachers are very, very busy people, and they aren't given time to go and look for these things. The teachers that I know who are what I call the really aggressive users of technology are often people who invest a great deal of their own time and resources and effort to get access to information.

But it doesn't have to be that way. For example, there has been an electronic network that has been up and running on an experimental basis—I think it was funded by a number of States—that connected the science coordinators at the State level. And one of the things those people did was to pose areas where curriculum needs were most critical and to ask what have we got in the way of good resources. Those resources, then, were filtered back down to the teachers in those particular States—or, go back to Montana's Big Sky. What you have there is a community of teachers who really support each other and who share information, and it is the collective knowledge that is so important. It is not that every teacher needs to know everything, but they have to be able to go somewhere easily and quickly to get the information that they need. And they can't wait a month or 2 months to get the information—by then, the topic is gone, and they are on to other things.

Senator BINGAMAN. Now, the development of educational software in different subject areas is not covered in your distance learning analysis, I guess.

Ms. ROBERTS. No, not directly. That was our first report—but I'd be happy to answer questions on it.

Senator BINGAMAN. Tell me what is the Federal Government doing to promote the development and dissemination of educational software for use in public schools.

Ms. ROBERTS. I would say very little, directly. If you are talking about——

Senator BINGAMAN. A "discrete" effort, right?

Ms. ROBERTS. Yes. Where the Federal influence has been most important has been, quite honestly, in Chapter II funds which flow from the Federal Government to the State to the schools, where schools have the opportunity to use those moneys to acquire technology.

But if you look at the question of have we made a significant investment in research and development, taking the risks, thinking about what our most critical needs are and where we could create prototypes and really powerful tools for learning, I would have to say that the Federal investment has been minimal. There certainly have been some projects, and there have been more in math and science because NSF has been there to be the patron in some sense of educational or computer software development—but in a limited sense.

We have whole areas of the curriculum that we haven't paid any attention to.

Senator BINGAMAN. It would seem that in foreign language instruction, educational software would be a very useful tool.

Ms. ROBERTS. I would say foreign language, but I would also say English as a second language. We have a growing number of students in our schools who need resources, and they need them now, and we could be doing much more in that area.

Senator BINGAMAN. Let me ask finally, and then we'll get on to the remaining panels so they don't think I am filibustering here, what is your thinking on this—there is a company located, I believe, over here in Arlington, VA, called The Teaching Company—I think that's what it is called. At any rate, I ordered a couple of audio cassettes from them. They essentially go around to universities and record the lectures, or record lecture series by what they have determined to be the best university professors in different subjects, whether it is American history or geopolitics of Shakespeare or whatever, and then they sell these, and they sell you a set of the videos or a set of the audio tapes. Is that something that is being done? It seems like a fairly normal thing to have. I mean, the curriculum in our public schools if you get down to the high school level is fairly constant—I mean, you are always going to have someone teaching biology. It seems like you could get a very well-developed set of course work on that, and you could build a course around a set of videotapes which presented that course work. Does that make sense? Is that happening?

Ms. ROBERTS. I am trying to think of an example in materials for students. The best example I can think of is the anthologies that we have if we think about traditional textbooks. We have a lot of

materials like that, and we could increasingly think about the kind of information that we could have sort of in an encyclopedia/library kind of resource that would be available that might be on video, that might be on CD-ROM technology. There is a lot happening there.

But I have to go back and say that that feels like such a simple kind of solution—you know, we'll get Carl Sagan, for example, to talk about billions and trillions of whatever in the atmosphere. But I think in the end we really know that we have to have mediators, and those are our teachers, and they are the people who know the students and who know how they learn, what their needs are, what they already know, and can—while not necessarily any longer be the fountains or vessels of information, if you will—but they have to be there. They have to be the facilitators. They have to be the coaches that might enable a student, for example, to want to not only hear a lecture but maybe want to view a Shakespearean play, or watch the Civil War series.

If you ask me what we have available, we have an awful lot of wonderful resources that some of our teachers are already beginning to utilize. And I really do want to point out that many of the materials that have been shown on broadcast television, I'm sure as Sandy Welch will point out later, are now available on videocassette.

Senator BINGAMAN. And are they available in a practical sense for the average classroom teacher who wants those, or are there all kinds of problems of getting the resources to order them and having to persuade your school board that this is more important than football? I mean, have we set up some kind of system so that these are in fact available for teachers, rather than theoretically available for teachers?

Ms. ROBERTS. In fact they are available in some schools, and they are available because—and I'll give you the ideal circumstance—there has been some way to acquire the resource, either through the direct expenditure of local funds or through the State's expenditure of funds and then distribution to the local district, and at the same time, if we are talking about video cassette materials, there is accessible hardware available; you don't have to sign up 2 weeks in advance to have it available. There is hardware that works in the classroom or near the classroom, and there is a commitment and a support of the use of this kind of technology by the district, by the community, by the parents themselves.

I think we always have to understand that it is just not a simple—it is not just having it. There are all kinds of reasons why you have it and why you don't use it. There are also reasons why you don't have it in the first place.

I'm sorry that my answer isn't straightforward, but it can be there—it is there for some districts, for some teachers, but certainly not for everybody.

Senator BINGAMAN. Thank you very much. I appreciate you being here today.

Ms. ROBERTS. Thank you, Senator.

Senator BINGAMAN. Our second panel consists of three individuals—Ms. Laura Eshbaugh is vice chairman of Whittle Communications; Mr. Gary Rowe is senior vice president of Turner Educa-

tional Services; and Ms. Sandra Welch is executive vice president of education services for Public Broadcasting Service in Arlington, VA.

We appreciate all of you being here, and we'll start with Ms. Eshbaugh.

STATEMENTS OF LAURA ESHBAUGH, VICE CHAIRMAN, WHITTLE COMMUNICATIONS, KNOXVILLE, TN; GARY R. ROWE, SENIOR VICE PRESIDENT, TURNER EDUCATIONAL SERVICES, ATLANTA, GA; AND SANDRA H. WELCH, EXECUTIVE VICE PRESIDENT, EDUCATION SERVICES, PUBLIC BROADCASTING SERVICE, ALEXANDRIA, VA

Ms. ESHBAUGH. Good morning, Mr. Chairman.

Whittle Communications appreciates the opportunity to appear before you and participate in today's discussion. My name is Laura Eshbaugh, and I am vice chairman of Whittle Communications.

This is an important discussion, and we commend the Senate for its desire to learn. A key challenge in American education today is how to equip teachers with the best tools to educate our young people.

I am going to summarize today the remarks that are in my testimony that you have previously received and then be available for questions with the panel.

The Whittle Educational Network represents my company's very serious commitment to introducing technology to classrooms. With an initial investment of more than $150 million, it represents the largest single introduction of television equipment to secondary schools in U.S. history.

Our commitment has met with great acceptance, an obvious indication of the pressing need educators on the local level feel for new technology and the access to educational programming it affords them.

Since we announced the idea of Channel One, the daily news component of the network, in the winter of 1989, over 10,000 schools in 47 States have requested our service. That is more than we currently have equipment to provide. Next month, approximately six million teenage students will see Channel One news programming in its third season, and the 9,000-plus schools participating in the network will have access to their own in-house, closed circuit television system.

Let me briefly outline for you what a school receives under a subscription to the Whittle Educational Network. The first component is Channel One, the daily 12-minute news and information program produced especially for a teenage audience. Our production staff, based in New York, includes news producers and writers with extensive network experience. Channel One world and national news footage comes from our own crews plus those of VIS News, which is a joint venture of NBC, Reuters, and the British Broadcasting Corporation. The program includes 10 minutes of news and 2 minutes of commercials and public service announcements.

The second component of the network is the Classroom Channel, which provides participating schools with several hundred hours of noncommercial educational programming every academic year.

This channel is operated by Pacific Mountain Network, which is an association of 43 public television stations in the Western United States.

Pacific Mountain Network through the Classroom Channel offers schools a wide variety of programming, from foreign language classes to documentaries to science programming as well.

The third component of the network is the Educators' Channel, which offers schools programs designed for educators. During the last school year, for example, Judy Woodruff of McNeil-Lehrer NewsHour hosted "American Classroom", which was a series of programs covering educational developments in research, teaching, and classroom management.

The final component of the network is an equipment package. Each school participating in the network receives a package consisting of a 19-inch color television set for every 23 participating students. Typically, this means that most or all of a school's classrooms receive televisions. The televisions are connected by cable to a central recording and playback station. They also receive two VHS-format videocassette recorders that can automatically record programming and play it back over the system. Finally, they receive a fixed, KU-band satellite dish and the equipment necessary to receive the programming of the Classroom Channel, the Educators' Channel, and Channel One.

The only limit that Whittle places on use of the equipment we provide and maintain, by the way, is that it cannot be used for a program competitive to Channel One; no such competing program exists today.

Given the freedom to use the equipment package for other school purposes, schools have hooked their local cable television service into our system, thereby providing access to network television, PBS, CNN, Discovery, and other channels of programming for their use. Schools have also connected video cameras to the system and launched their own in-house broadcast, often conducted by the school's journalism classes.

Let me give you an interesting example of that. Last month, the graduation ceremonies at Pennsauken High School in Pennsauken, NJ were moved indoors because of rain. The school's auditorium would not accommodate the crowd, so the principal set up a video camera in the auditorium and dispersed the overflow audience into the school's classrooms, and they watched the graduation ceremonies over the Channel One television system.

In addition to such uses, a number of schools have added a second satellite dish or connected their existing satellite dish into our system to expand their ability to use distance learning resources.

There are a few other important things that you might want to know about this service. The entire network, from television repairs in Albuquerque to studios in New York to camera crews in Moscow is provided to the schools without charge. The entire network is funded by the 2 minutes of commercials that air during the daily Channel One broadcast.

Channel One and the Educators' Channel have active boards of advisors, many of whom are classroom teachers, to help us shape our programming to meet the needs of educators. The Whittle Edu-

cational Network also has a council of advisors chaired by former US Secretary of Education Terrell H. Bell, and including among others Dr. Constance Clayton, superintendent of schools for the school district of Philadelphia, Howard Mehlinger, director for the Center of Excellence in Education at Indiana University, and Federal Express Chairman Frederick Smith.

The initial idea for the Channel One program came from classroom teachers who spoke of the need to provide students with current events information in the medium of their generation—television. In exploring how to meet that need, we came face-to-face with an even greater challenge—how can teachers use a daily news program, or any educational programming for that matter, as an integral classroom tool if the most that schools have is a handful of television sets and even fewer videocassette recorders.

Great television programming is useless without the equipment to watch it. Electricity isn't very useful either unless you also have lightbulbs. It was clear that the cost of a $150 million technology package could not be passed along to the school systems struggling to fund their most basic expenses. That is why there are commercials on Channel One. Dollars that might otherwise to go support sitcoms or music videos are now being channelled to provide educational programming and equipment for our schools on an unprecedented scale. Those commercials mean the network can be made available without charge.

By this fall, less than 3 years since the announcement of our plan, Whittle will have installed television sets in close to 300,000 classrooms and installed 18,000 VCRs and over 9,000 satellite dishes in schools from one coast to the other.

Our goals for the Whittle Educational Network are far-reaching. We will work with teachers closely to help integrate television programming into their curriculums. Many teachers see television as a powerful tool, a new weapon in their arsenal, and they are anxious to make it a part of their lesson plans. We want to help them succeed. Their success is our success, not only as a company but as a Nation.

Thank you very much for this opportunity to appear today.

[The prepared statement of Ms. Eshbaugh follows:]

PREPARED STATEMENT OF LAURA ESHBAUGH

Good morning, Mr. Chairman. Whittle Communications appreciates the opportunity to appear before you and participate in today's discussion on educational programming and technology. My name is Laura Eshbaugh and I am Vice Chairman of Whittle Communications.

This is an important discussion and we commend the Senate for its concern and its desire to learn. A key challenge in American education today is how to equip teachers with the best tools to educate our young people.

For years, teachers of the Space Age—our age—were limited to tools that would have been familiar in the hands of a teacher 100 years ago. While the world traveled into the air, and then into space, while television and telephone and computer and satellite technologies were invented and improved, the American classroom stood still.

Our classroom teachers—dedicated to one of our nation's most important and difficult tasks—never reaped many of the technological benefits of the society they serve.

This is not to say that technology is a panacea or the answer to all our educational woes. And it is not to say a student must have "high tech" equipment to receive a solid education. In that same light, we can also say American businesses, for exam-

ple, could still function and conduct their affairs without telephones, or fax machines, or computers, or copiers, or automobiles, or airplanes. We all know business would not work as well as it could under such handicaps. It would not be using all of the resources available to it to get the job done. It would be missing an opportunity to reach its greatest potential. It would be less than it could be.

It may be that our schools today are less than they could be. In many school districts, the homes where the students live have better and more extensive electronic equipment than the school they attend. In a survey conducted early last year, the Gallup Organization found that, when asked, 85 percent of teachers said none of the classrooms in which they teach had televisions. In larger cities, that grew to 92 percent. This paucity of equipment is, in the main, due not to educational philosophy or choice, but to the simple lack of funds. A lack of funds that, given the current constraints on state and local budgets, is likely to continue into the foreseeable future.

So new ways had to be found to introduce technology into the classroom. Many efforts have been initiated. The STAR program is a good example. And, on the local level, there have been innumerable fundraisers to purchase computers and other electronic equipment for neighborhood schools. A number of businesses at the local, state and national level have made providing technology to schools a priority.

The Whittle Educational Network represents my company's very serious commitment to introducing technology to classrooms. With an initial investment of more than $150,000,000, it represents the largest single introduction of television equipment to secondary schools in U.S. history.

Our commitment has met with great acceptance, an obvious indication of the pressing need educators on the local level feel for new technology and the access to educational programming it affords them. Since we announced the idea of Channel One, the daily news component of the Network, in the winter of 1989, more than 10,100 schools in 47 states have requested our service—that's more schools than we currently have equipment to provide. Next month, approximately 6 million teenage students will see the Channel One news program in its third season. And our 9,000 schools will have access to their own in-house, closed-circuit television system.

Let me briefly outline for you what a school receives under a subscription to the Whittle Educational Network. We provide:

• **Channel One**, which is the name of our daily 12-minute news and information program produced especially for a teenage audience. Our production staff, based in New York, includes news producers and writers with extensive network experience. Channel One world and national news footage comes from its own crews and VIS News, a joint venture of NBC, Reuters, and the British Broadcasting Corporation. The program includes 10 minutes of news and 2 minutes of commercials and public service announcements.

• **The Classroom Channel** provides participating schools several hundred hours of non-commercial educational programming every academic year. The channel is operated by the Pacific Mountain Network, an association of 43 public television stations in the western U.S. It offers schools a wide variety of programming—from foreign language classes to documentaries.

• **The Educator's Channel** offers schools programming for educators. During the last school year, for example, McNeil-Lehrer NewsHour's Judy Woodruff hosted "American Classroom," a series of programs covering education developments in research, teaching, and classroom management.

• **Equipment.** In essence, each school receives its own in-house, closed-circuit television system that educators may use at their discretion.

Each school receives:

• A 19-inch color television for every 23 participating students. Typically, this means all or most of a school's classrooms receive televisions. The televisions are connected by cable to a central recording and playback station.

• Two VHS-format videocassette recorders that can automatically record programming and play it back over the system.

• A fixed, KU-Band satellite dish and the equipment necessary to receive our programming.

The only limit Whittle places on the use of the equipment we provide and maintain is that it cannot be used for a program competitive to Channel One. No such competing program exists today.

This lack of restrictions on the use of the equipment has stimulated American teachers. Their resourcefulness in using our system has been nothing short of astonishing. Many schools have hooked our system to their local cable television service, allowing them to receive network television, PBS, CNN, Discovery and other channels of programming for their use. Schools have also connected video cameras to the system and launched their own in-house broadcasts, often conducted by the school's

journalism classes. School administrators and student government representatives use it to hold electronic assemblies of the student body, make announcements, and more.

Let me give you an interesting example. Last month, the graduation ceremonies at Pennsauken High School in Pennsauken, New Jersey, were moved indoors because of rain. The school's auditorium would not accommodate the crowd, so the principal set up a video camera there and dispersed the overflow audience to the school's classrooms where they watched the graduation ceremonies over the Channel One television system.

In addition to these uses, a number of schools have added a second satellite dish or connected their existing satellite dish into our system to expand their ability to use distance learning resources.

There are a few other important things you should know about this service:

• The entire Network—from television repairs in Albuquerque to studios in New York to camera crews in Moscow—is provided to schools without charge. The entire Network is funded by the 2 minutes of commercials that air during the daily Channel One broadcast.

• Each school has the right to preview each day's edition of Channel One and the right to not show that day's program to the student body if educators find anything objectionable—in the editorial or advertising content. Schools have the option of showing all or none of the additional programming we provide.

In addition, Channel One and The Educators' Channel have active boards of advisors—many of whom are classroom teachers—to help us shape our programming for the needs of educators. The Whittle Educational Network also has a Council of Advisors, chaired by former U.S. Secretary of Education Terrel H. Bell, which includes among others Dr. Constance Clayton, Superintendent of Schools for the School District of Philadelphia, Howard Mehlinger, Director for the Center of Excellence in Education at Indiana University, and Federal Express chairman Frederick Smith.

• We have awarded a $900,000 research grant to conduct a thorough, comprehensive study of the impact of Channel One on students. Whittle awarded the grant to Dr. Jerome Johnston of the Institute for Social Research at The University of Michigan, and Dr. Evelyn Brzezinski of Interwest Applied Research in Beaverton, Oregon.

The 3-year study, which began in the fall of 1990, will use a variety of research strategies to understand the impact Channel One has on student learning, classroom teaching and curriculum organization.

Whittle Communications believes in Channel One and the value of the entire Whittle Educational Network. With this level of support and acceptance by classroom educators, it should come as no surprise to you that the initial idea for Channel One came from a brainstorming session with a group of classroom teachers several years ago.

As a publisher of print media for use in schools for 20 years, Whittle is always talking with teachers. During one of these group sessions a teacher essentially said "we don't need another publication, we need a 'Today Show' for teenagers." That was the seed that grew into Channel One.

But in preparing to meet one challenge—developing a daily news program for teenagers—we were promptly faced with another. That is the issue before us today. How can teachers use a daily news program or any educational program, for that matter, as an integral classroom tool if the most schools have is a handful of television sets and even fewer videocassette recorders? Great television programming is useless without the equipment to watch it. Electricity is not very useful unless you have light bulbs, too.

For our effort, the answer to the question was obvious and daunting and very expensive. Any classroom teacher, any principal, any superintendent, and any school board member will tell you that to try to pass along the costs of a $150,000,000 technology program to local school districts would be pure folly. Most are scraping to fund their most basic costs—textbooks, teacher salaries, bus services, building maintenance, etc.

That is why there are commercials on Channel One. Money that may have been spent sponsoring another rerun of Gilligan's Island or a music video is now providing television equipment and educational programming for our schools on an unprecedented scale.

We are proud to be able to offer this extensive service—without charge—to our nation's schools. We are proud, too, that the Whittle Educational Network is a profit-making enterprise that benefits all those involved. Without that business incentive and without the commercials, this Network would not exist. Unlike the business charity that we applaud, Channel One represents a true business-education partnership.

The conclusion of our efforts and our investment: By this fall—less than 3 years since the announcement of our plan—Whittle will have installed television sets in some 300,000 classrooms, and installed 18,000 VCRs and 9,000 satellite dishes in schools from one coast to the other.

Our goals for the Whittle Educational Network are far-reaching. We will work closely with teachers wanting to integrate television programming into their curriculum. For many of them, television is a powerful tool—a new weapon in their arsenal—and they are anxious to make it part of their lesson plans. We want to help them succeed. Their success is our success—not only as a company, but as a nation.

Thank you very much for this opportunity, and I am prepared to answer any questions you may have.

SUMMARY OF TESTIMONY BY LAURA ESHBAUGH, VICE CHAIRMAN OF WHITTLE COMMUNICATIONS, BEFORE THE U.S. SENATE SUBCOMMITTEE ON EDUCATION, ARTS AND HUMANITIES, JULY 26, 1991

The Whittle Educational Network—a comprehensive telecommunications service providing educational programming and television equipment—has been requested by more than 10,000 schools in 47 states, representing more than six million teenagers.

When a school subscribes to the Network, it receives:

• **Channel One,** a daily 12-minute news and information program designed especially for a teenage audience. Our production staff includes news producers and writers with extensive network experience. Channel One world and national news footage comes from its own crews and VIS News, a joint venture of NBC, Reuters, and the British Broadcasting Corporation. The program includes 10 minutes of news and 2 minutes of commercials and public service announcements.

• **The Classroom Channel** provides participating schools several hundred hours of noncommercial educational programming every academic year. The channel is operated by the Pacific Mountain Network, an association of 43 public television stations in the western United States.

• **The Educators' Channel** offers schools programming for educators. During the last year, for example, McNeil-Lehrer NewsHour's Judy Woodruff hosted "American Classroom," a series of programs covering education developments in research, teaching and classroom management.

• **Equipment.** Each school receives its own in-house, closed-circuit television system that educators may use at their discretion. Each school receives:

• A 19-inch color television for every 23 participating students. Typically, this means all or most of a school's classrooms receive televisions. The televisions are connected by cable to a central recording and playback station.

• Two VHS-format videocassette recorders that can automatically record programming and play it back over the system.

• A fixed, KU-Band satellite dish and the equipment necessary to receive our programming.

Because Whittle does not limit the use of this equipment (with the exception of a program directly competitive with Channel One should one be developed), educators have made extraordinary use of the system. Many schools have hooked our system to their local cable television service, allowing them to receive network television, PBS, CNN, Discovery and other channels of programming for their use. They have also connected the system to a second satellite dish to access distance learning programs. Some have added video cameras and launched their own in-house broadcasts, often conducted by the school's journalism classes.

The entire Network—from television repairs in Albuquerque to New York studios to camera crews in Moscow—is provided to schools without charge. The Network is fully funded by the commercials that air during the daily Channel One broadcast.

Senator BINGAMAN. Thank you very much.

Before I ask any questions, let's hear from the other witnesses. Mr. Rowe, please go ahead.

Mr. ROWE. I am honored, Mr. Chairman, to be here to represent my company in its support of the Nation's educators.

This hearing properly raises questions about the role of television in schools and attempts by businesses to assist educators with television resources. Our Nation wrestles with transforming schools

from the Industrial Age model that turned out workers for our factories to an Information Age model that prepares our students for citizenship in a global village.

What must those schools be like as we look into the future? The wisdom that we hear from educators suggests that information resources from television can help. They can help make schools seem more relevant to students; they can help empower teachers with new learning resources.

Schools should be able to capture, record, and play images available from television programmers—not because students should be watching TV in schools—I think this is a very important distinction—they should not be; passive viewing of television is a waste of time—but using television in the classroom, using it, can animate learning and connect the world outside schools to the world that is happening inside them.

Let me explain. If there is a television set in the classroom, students can watch passively. That has a limited useful purpose. But if a videocassette recorder is hooked to the television set, and the teacher is given control of it, a passive experience can become an active one. The television set in this sense is transformed. The decisions about its content are no longer controlled by a programming source in some remote location. It is not CNN, for example, that is the ultimate controller of the news; the content is guided and controlled by a professional educator. Add a cable hookup to the combination of the VCR and the TV set with the multiple channels of information that reside there, carried on its bandwith, and a rich array of resources is possible that schools never had before.

This is really a part of the same revolution of television in our homes. Once we were dependent on a handful of programming executives sitting on 6th Avenue in New York, deciding in essence what we could see around our Nation. Now we are liberated. We've got cable, we've got VCRs, we've got local video rental stores, we can time-shift programming, we can watch television at our leisure and in our own way, make up our own menu as we go along.

As surely as the phonetic alphabet and the printing press revolutionized human knowledge, I think we are beginning to realize that this medium, still quite in its infancy in a lot of ways, is not only shrinking the size of our planet but is changing fundamentally how we perceive, process, understand and act on information.

Dr. Mary Alice White of Columbia University Teachers College writes: "Information is shifting from print to imagery, and the shift is affecting deeply how we see our world, how we think about it, and how we solve its problems." That has an impact on students.

Turner Educational Services is the division of Turner Broadcasting System that supports the work of educators by repurposing television programs produced for our networks to form a usable library of sight and sound as classroom resources.

In this work, we follow three mandates that we learned from educators—we weren't smart enough to think of this ourselves first to repurpose programs into usable segments of brief duration to fit the instructional agenda of the classroom; second, to support the use of these videos with the written word to assist the teacher in their use, and third, to conform our work to the curriculum that

already exists in schools and not impose a new one from the outside.

In 1987, we formed a relationship with the National School Boards Association to test the use of news programming in schools. This test relied on permitting schools to tape record and time-shift news on CNN and to deliver timely classroom guides using electronic mail. Based on the model we developed in this collaborative effort with educators, we proved to our satisfaction that there is in fact an appetite for contemporary information in schools and that such information, properly configured, can support traditional forms of instruction.

In 1989, R.E. Turner, our chairman, announced a news service designed especially for schools and available every day of the school year and throughout the summer recess. Titled "CNN NEWSROOM" and carried on CNN at 3:45 a.m. Eastern Time, it is a program designed for the VCR. That is, schools can capture the program on tape and use it at the discretion of classroom teachers. It is available with a daily classroom guide written by professional educators, working in tandem with our journalists. The classroom guide is available in some parts of the United States on free electronic mail services and in all parts of the country on E-mail and fax services at a modest telephone access charge of about one dollar per day.

Now about to enter its third school year, CNN NEWSROOM has licensed over 21,000 schools in all 50 States to use the program. Enrollments are also growing internationally. Designed in collaboration with leading educators, we see the purpose of the program very clearly as an opportunity for teachers to connect events in the real world to class discussion, reading, library research, homework, and critical thinking skills. It invites students to do what our journalists do, to use information, research facts, organize ideas, assemble resources, read, write, spell, measure, organize, synthesize, compile, edit and report.

Let me emphasize the most important features of CNN NEWSROOM. It is free of advertising. It is copyright-cleared for teachers to record, retain and exhibit freely in classrooms, and the school enrollment is a license without requirements. Schools are not obligated to do anything with our program except what the professional educators in that school decide in their own discretion. It is television news controlled by teachers.

We believe this new model of television works. It is not passive viewing, but television used as a springboard to learning, as an active learning tool. If you watch teachers use our program, the most successful ones do so by selecting only those portions of the daily program appropriate to their classroom needs. They frequently use the pause control to interrupt and interact with students, and they use other school resources that they connect to the program—everything from textbooks to wall maps to dictionaries and homework assignments.

The reactions from students and teachers prove that electronic information has a critical role to play in learning. For example, during the crisis in the Persian Gulf, CNN NEWSROOM gave teachers the option to bring this conflict in the world into schools and give it context, relevance and meaning. Using CNN NEWS-

ROOM, students were able to study the crisis, to understand the historical background of the events that led to that war, the political and economic geography of the Middle East, the governments and leaders, the religion and culture, and the points of view of the parties to the conflict. Just as we were very aware that all the world's leaders were tuned in to the same thing, that was an opportunity, happily, that we were able to invest in schools.

In keeping with our commitment to give teachers timely resources, we determined to clear the copyright on all CNN coverage of the Persian Gulf war so that copyright clearance gave schools the opportunity to tape record and use everything that we had on the air.

In a study slated to be published later this year by California State University, Chico, a researcher who travelled to schools using our program heard teachers tell stories about student achievement. According to teachers, vocabulary levels of students jumped as much as 2 years. Students are becoming more active citizens and reflect better critical thinking skills. They are more aware of what is going on in the world and genuinely care about what they see on the news. There are increases in observation skills, higher test scores in geography, and active reading of newspapers and news magazines in these schools, all of it testifying to the impact of television news.

But I want to underscore what I think the reality of this really amounts to. We didn't make that happen. It is the teachers who did; the teachers who used the program effectively.

In conclusion, I want to put our effort in a larger context. We are working with colleagues throughout the cable television industry to support education. I believe we all share the point of view that businesses should support education, but not attempt to take over the role of the professional practitioner. We have resources that we believe help schools, but we don't have answers for the problems in them.

Ted Turner's announcement of our program was joined by other cable networks and cable television operating companies. Together, they formed Cable in the Classroom, an alliance pledged to provide free basic cable service to all middle and secondary schools passed by cable along with commercial-free, copyright-cleared programs supported by teaching materials. Today there are 43 cable companies, representing service to over 80 percent of cable customers across the Nation engaged in this effort. Twenty programmer members of Cable in the Classroom provide over 150 hours per week of curriculum-connected programming including coverage of the Senate and the House of Representatives. These resources impose no obligations on schools. They are available to the professional educator who knows what many professional educators have taught to us—that television at its best is a daily diary of planet earth, and compelling images, sight and sound, and that in the hands of teachers, there are options for schools that can make a dramatic difference in what students learn and understand.

Thank you for your attention.

[The prepared statement of Mr. Rowe follows:]

PREPARED STATEMENT OF GARY R. ROWE

Mr. CHAIRMAN: I am honored by the opportunity to inform the Senate through this Subcommittee about the activities of my company in support of the nation's educators.

This hearing properly raises questions about the role of television in schools and attempts by businesses to assist educators with television resources. Our Nation wrestles with transforming schools from the industrial age model that turned out workers for our factories to an information age model that must produce students able to live in a global village.

What must those schools be like? The wisdom we hear from educators suggests that information resources from television can help to make schools relevant to students, and that teachers can be empowered by these resources. Schools should be able to capture, record, and play images available from television programmers, not because students should be *watching* TV in classrooms—they should not—but because *using* television in classrooms animates learning and connects the world outside school walls to the learning inside them.

Let me explain. If there is a television set in a classroom, students can passively watch images. This has, at times, served a limited useful purpose. However, if a video cassette recorder is hooked to the television set and the teacher is given control of it, a passive experience can become an active one. The television set is transformed. The decisions about its content no longer reside in a remote programming source, the content is guided and controlled by a professional educator. Add a cable hookup to the combined television and VCR with the multiple channels of information carried on its bandwidth, and a rich array of resources is possible that schools never had before.

This is really part of the same revolution in television we are beginning to recognize in our homes. Cable television has liberated viewers from limited choices and the VCR has liberated us from the clock. We can not only choose from a wide menu of program options but we can time shift it to our convenience.

As surely as the phonetic alphabet and the printing press revolutionized human knowledge, we are beginning to realize that television is not only shrinking the size of our planet but is changing fundamentally how we receive, process, understand, and act on information. Dr. Mary Alice White of Columbia University's Teachers College writes: "Information is shifting from print to imagery . . . and the shift . . . is affecting deeply how we see our world, how we think about it, and how we solve [its] problems."

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In 1987, we formed a relationship with the National School Boards Association to test the use of news programming in classrooms. This test relied on permitting schools to tape record and time shift news on CNN and to deliver timely classroom guides using electronic mail. Based on the model we developed in this collaborative effort with educators, we proved to our satisfaction that there is, in fact, an appetite for contemporary information in schools and that such information, properly configured, can support traditional forms of instruction.

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Now about to enter its third school year, CNN NEWSROOM has licensed over 21,000 schools in all 50 states to use the program. Enrollments are also growing internationally. Designed in collaboration with leading educators, it is an opportunity to connect events in the real world to class discussion, reading, library research, homework and critical thinking skills. It invites students to do what journalists do:

to use information, research facts, organize ideas, assemble resources, read, write, spell, measure, organize, synthesize, compile, edit and report.

Let me emphasize the most important features of CNN NEWSROOM. It is free of advertising. It is copyright cleared for teachers to record, retain, and exhibit freely in classrooms, and a school enrollment is a license without requirements. Schools are not obligated to do anything with our program except what the professional educators in that school decide in their own discretion. It is television news controlled by teachers.

This new model of television works: not passive viewing, but using television as a springboard to learning. If you watch teachers use our program, the most successful ones do so by selecting only those portions of the daily program appropriate to their classroom needs. They frequently use the pause control to interrupt and interact with the students, and they use other school resources that they connect to the program—everything from textbooks to wall maps to dictionaries to homework assignments.

The reactions from teachers and students prove that electronic information has a critical role to play in learning. For example, during the crisis in the Persian Gulf, CNN NEWSROOM gave teachers the option to bring conflict in the world into schools and give it context, relevance, and meaning. Using CNN NEWSROOM, students were able to study the crisis, to understand the historical background of the events that led to war, the political and economic geography of the region, the governments and leaders, the religion and culture and the points-of-view of the parties to the conflict. In keeping with its commitment to give teachers the timely resources to help students understand the war in the Gulf, Turner Educational Services announced on January 14 copyright clearance for schools to tape record and use *all* of CNN's coverage of the conflict thereby giving schools a front row seat to history-making events.

In a study slated to be published later this year by California State University, Chico, a researcher who traveled to schools using our program heard teachers tell stories about student achievement. According to teachers, vocabulary levels of students jumped as much as 2 years. Students are becoming more active citizens and reflect better critical thinking skills. They are more aware of what's going on in the world and genuinely care about what they see on the news. Increases in observation skills, higher test scores in geography, and active reading of newspapers and news magazines in these schools all testify to the impact of television news in classrooms.

But I want to underscore the reality this study addresses. None of this is happening in schools because CNN NEWSROOM made it happen. It's teachers who make it happen, teachers who prompt that achievement. Our role is simply to provide the best news coverage we can produce to meet the needs of teachers.

In conclusion, I want to put our effort in context. We are working with colleagues throughout the cable television industry to support education. I believe we all share the point of view that businesses should support education but not attempt to take over the role of the professional practitioner. We have resources but we don't have answers.

Ted Turner's announcement of our program was joined by other cable networks and cable television operating companies. Together, they formed Cable in the Classroom, an alliance pledged to provide free basic cable service to all middle and secondary schools passed by cable along with commercial free, copyright cleared programs supported by teaching materials. Today, there are 43 cable companies representing service to over 80 percent of cable customers across the nation engaged in this effort. Twenty programmer members of Cable in the Classroom provide over 150 hours per week of curriculum connected programming, including coverage of the Senate and the House of Representatives. These resources impose no obligations on schools. They are available to the professional educator who knows what many professional educators have taught us: that television at its best is a daily diary of planet earth in compelling images, in sight and sound, and that in the hands of teachers, there are options for schools that can make a dramatic difference in what we learn and understand.

Thank you for your attention. I will be happy to respond to any questions that you may have.

Exhibit pages attached explain the format of CNN NEWSROOM, the delivery of the classroom guide with a representative example, and the growth and use of the program.

WHAT IS CNN NEWSROOM?

CNN NEWSROOM Co-anchors, Brian Todd and Cassandra Henderson

CNN NEWSROOM is a fifteen-minute, **commercial free**, cable delivered news program offered free of charge to middle and secondary schools. **There is no charge for CNN NEWSROOM.** The program airs each weekday at 12:45 AM (PT) on CNN, providing schools with the most up-to-the-minute news coverage from around the world. Educators can record CNN NEWSROOM using a VCR and utilize the program anytime in their curriculum. **Teachers control** when, where and how often to use CNN NEWSROOM in their classes. In addition, **a daily classroom guide**, designed by professional educators, is available to use with each day's program.

Drawing upon the same resources that make CNN an invaluable source of news and information to over 50 million cable homes, CNN NEWSROOM provides a daily video news program that keeps students in touch with the issues of the day.

Created in collaboration with leading educators, CNN NEWSROOM goes to the core of the curriculum by **encouraging students to use information**, research facts, organize ideas, assemble resources, read, write, spell, measure, analyze, organize, synthesize, compile, edit and report. The classroom is in effect turned into a newsroom, delivering expert information on politics, science, technology and the top stories from around the world. CNN NEWSROOM uses the power of cable television to put **today's world in perspective for tomorrow's leaders**.

Each edition of CNN NEWSROOM begins with a news segment which reviews the day's top stories, including a detailed report on a story of topical interest. The second segment features incisive reports which apply to a variety of subject areas:

MONDAY - *Future Desk:* Focusing insightful reporting on global issues, developments and unfolding trends in the news and anticipated events in the week ahead.

TUESDAY - *International Desk:* Exploring selected international events around the globe with CNN cameras and leading news organizations from other nations.

WEDNESDAY - *Business Desk:* Examining the exciting world of business and commerce and explaining how news from Wall Street affects Main Street.

THURSDAY - *Science Desk:* Identifying scientists and explorers while reporting scientific achievements that will shape tomorrow.

FRIDAY - *Editor's Desk:* Developing students' communication skills by surveying the world of media and its treasury of human interest stories, news reporting and editorial features.

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THE DAILY CLASSROOM GUIDE

The Daily Classroom Guide provides a wealth of helpful suggestions on how to integrate CNN NEWSROOM into classrooms. The daily guide is available through three independent electronic mail services, as well as several state department of education networks.

SERVICE	DESCRIPTION	COST
INDEPENDENT ELECTRONIC MAIL SERVICES		
GTE 1-800-634-5444	Educational telecommunications network for downloading the Classroom Guide to your personal computer, at a preset time in the morning. When you subscribe to this service, you receive a password on a computer screen guiding you through the process.	**Option 1:** $198 flat subscription fee per school year provides "autodownload" software to access the guide for CNN NEWSROOM. **Option 2:** $75 flat subscription fee per summer session provides "autodownload" software to access the guide for CNN NEWSROOM.
MCI Mail FAX: 1-800-388-4131 E-MAIL: 1-800-388-4128	Mail service providing direct delivery of the daily guide via fax machine, printed every morning for user.	**Option 1 - Fax:** $40 per month with a 5% discount for registering for an entire year.
	On-line delivery of the classroom guide through telecommunications. User will receive complete instructions on how to use their computer to retrieve the guide by dialing a toll-free number.	**Option 2 - Electronic Mail:** $25 per month flat fee, with a 5% discount for registering for an entire year. 1-800 numbers are available for connection.
SPRESS X-Change 1-800-772-6397	Cable-delivered information service available through some local cable companies.	**Option 1:** $80 flat fee for software and a decoder box to run the service. **Option 2:** $189.95 fee for the satellite kit including software, TURO receiver, cable and infocipher.
STATE AND REGIONAL EDUCATION NETWORKS		
CALIFORNIA: **FRED Mail** **(619) 475-4852**	A non-profit electronic bulletin board network distributing the Classroom Guide to schools throughout the San Diego County area.	Free to all schools.
CONNECTICUT: **E-Z Mail**	Telecommunications service sponsored by the Connecticut Department of Education.	Cost varies depending on location.
FLORIDA: **FIRN (Florida Information Resource Network)**	Telecommunications service sponsored by the Florida Department of Education.	Free to all schools in Florida.
GEORGIA: **EduNet**	Telecommunications service sponsored by Georgia College serving state schools and universities.	Free of charge to all schools in Georgia. Toll-free connect to all users.
NEW JERSEY: **New Jersey Link**	This new service combines "Learning Link NJ" and Educational Telecommunications Network" (ETN).	$150 annual subscription fee.
NEW YORK: **NYSE NET**	Telecommunications service sponsored by the New York Board of Education.	Free to qualified educators.
PENNSYLVANIA: **Penn Link**	Electronic mail and bulletin board service (92% of all public schools in Pennsylvania are currently using this system).	Free to all public schools in Pennsylvania.
LEARNING LINK NATIONAL CONSORTIUM	Membership organization of state education departments and public television stations, now available in 16 states.	No online charges; annual membership fees range from $0 to $190 depending on the local system.

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*       *    * *    * *
**********     ***     *** ANCHOR DESK
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Thursday July 11, 1991

DAILY NEWS BRIEFING

Segment Title	#	Program Rundown	Segment Time
OPENING	1		:45
TOP STORY	2	President Bush lifts economic sanctions against South Africa.	2:45
WORLD REACTION	3	Oladapo Fafowora, former Nigerian ambassador to the UN; and Prime Minister John Major.	:30
TODAY'S NEWSREEL	4	- Almost a year to the day after quitting the communist party, Boris Yeltsin is inaugurated as Russian president. - The Yugoslav republics take further steps away from civil war.	1:50
SCIENCE DESK	5	Serious scientific technology is behind the creation of laser light shows.	3:10
BEFORE THE REVOLUTION	6	Some braved the arduous journey to the New World only to fall victim to rampant disease.	3:10
DEFINITION	7	Prodigy	:15
OUR WORLD	8	Nine-year-old Serena Wilson is one of a promising group of "sports prodigies" who is tempted with million-dollar contracts.	2:00
CLOSE	9		:35

---------- EDITOR'S NOTES: TODAY'S NEWS TERMS ----------

sanctions apartheid compliance subjective Krugerrands
nuclear nonproliferation apothecary Brioni Agreement excel

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ANCHOR DESK July 11, 1991 (2)

TOP STORY

1. To what do you attribute President Bush's positive attitude toward the end of economic sanctions against South Africa? What are ANC leader Nelson Mandela's objections? How might lifting sanctions affect South Africa economically? Politically? Socially? Why are Black South Africans divided on this issue? What do you think administration sources mean when they say that compliance is "subjective?"
2. Ask students to list the five demands made of South Africa's government by the U.S. Congress. Select ONE of the conditions and find and present resources dating from 1986 that provide evidence to support or refute the statement: The South African government has complied with [this demand.]

WORLD REACTION

3. Divide the class into teams and have each defend one of the positions reflected in the two "reaction" quotes. Ask students to compose their own resolution, and let the debate begin!

NEWSREEL

4. Compose a brief biography of Russian President Boris Yeltsin for an upcoming edition of WHO'S WHO IN THE SOVIET UNION.
5. What is the next step in the Yugoslav peace negotiations? How did the Brioni Pact get its name? What are some of the conditions of the agreement?

OUR WORLD

6. How might involvement in high level athletic competition affect some young people? Would the challenge spur them to greater achievement or the pressure defeat their dreams? Explain. Do you agree with Richard Williams' rationale for rejecting the contracts offered to Serena by professional agents? Why or why not? What could professional sports agents and corporate sponsors gain from cultivating athletes at such young ages?
7. What aspects of Serena's life are different from that of typical 9-year-olds? Which are probably the same? Discuss the concept of internal motivation. Do you feel that most athletes compete "for themselves" as Marion Jones contends?
8. Marion Jones and Serena Williams are described as "sports prodigies." Throughout history, there have been many children who have shown extraordinary talent in fields as diverse as music, the sciences, and politics, i.e. Peter the Great was only 10 years old when he became Tsar of all the Russias. En-courage students to write and perform a one-act play about the amazing accomplishments of an historical OR imaginary child prodigy.

---------- ADVANCE ASSIGNMENT ----------

EDITOR'S DESK: COMPUTER ARTIST

July 11, 1991 (3)

DESK: LASER TECHNOLOGY

1. PREVIEWING: What does the acronym "LASER" stand for? (Light Amplification by Stimulated Emission of Radiation) Discuss the meaning of each word. Based on this "definition," explain the properties and various uses of lasers.

2. AFTER VIEWING: Create a web of words and ideas related to lasers. Classify these terms within categories that describe different functions of laser light. What are some of the most common uses of lasers? Explain the process of combining points of light to create animated "visual illusions." How does this application of laser technology reinforce the concept of "light amplification by stimulated emission of radiation?"

3. Have students research the makeup of lasers. Ask them to pay particular attention to the reaction that is needed to form the light beam. Have the students diagram a laser and color code the elements that are used to produce the laser effect. Encourage students to brainstorm futuristic inventions that make use of laser technology.

4. The segment goes into detail about the process used to produce laser shows. Have student groups use lights, gels and mirrors to create their own shows. Have them show each step of the process they use. If students have access to computer drawing programs, or are able to use programs such as BASIC, have them draft their final "laser drawn" display on the computer.

5. Laser shows are a purely fun usage of lasers. The video segment mentions a few other, more serious, uses for lasers. On the board, have the class list as many uses as they can, serious or otherwise, for laser technology. Divide the class into groups. Have each group research a different use of lasers. Groups can use library materials or even call companies that might use lasers in their workplace. They could set up visits to hospitals or other industries that use lasers. One group could set up a visit and demonstration by someone who uses lasers. Direct groups to share their work in displays or written reports.

----------EDITOR'S NOTES: TODAY'S NEWS TERMS ----------
laser technology animation sequences illusion wizardry

---------- NEWSROOM LIBRARY: RELIABLE SOURCES ----------
Boraiko, Allen. "A Splendid Light -- Lasers." NATIONAL GEOGRAPHIC MAGAZINE. March 1984. pp. 335-377.

July 11, 1991 (4)

STUDENT HANDOUT: THE APOTHECARY GARDEN

DIRECTIONS: In colonial times, medicines were often found in nearby forests or growing in small herb gardens behind the village apothecary shop. Long use often proved the effectiveness of such natural remedies; a chemical derived from the herb digitalis, long used to treat "faintness of heart," is the basis of a modern pharmaceutical with the same name and devoted to the same purpose. Research to find traditional treatments for each of the following symptoms of disease. Good sources may be herb and garden catalogues, the FOXFIRE books, almanacs, and old medical references. Compile these in a small home health manual. As a foreword to your booklet, use quotes and homilies about the relationship between good health and a long, happy life. Illustrate each entry if possible.

ABDOMINAL PAIN:

BROKEN BONES:

BLEEDING:

LACERATIONS/CONTUSIONS:

FEVER:

CONGESTION:

HEADACHE:

INSOMNIA:

NAUSEA:

COUGHING:

ARTHRITIS/STIFFNESS OF JOINTS:

COLIC IN INFANTS:

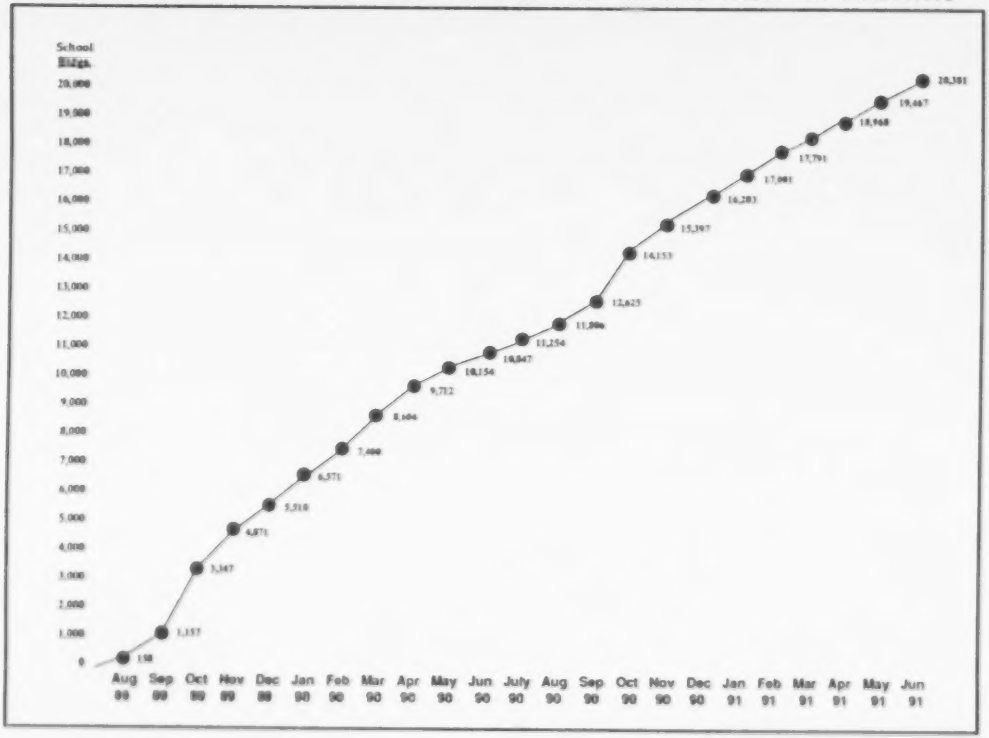
RASH/SKIN DISORDERS

CONSTIPATION:

OTHER:

"O, true Apothecary, thy drugs are swift..." -- William Shakespeare

CNN NEWSROOM'S ENROLLMENT GROWTH IN THE FIRST 20 MONTHS



MAJOR EDUCATIONAL ORGANIZATION ENDORSEMENTS

"CNN NEWSROOM is a perfect example of how corporate America can and should be supporting our public schools -- no strings no sales pitches, just a vision of the ultimate payback -- the best educated students in the world."

Tari Marshall
Director, Public Relations
National Parent Teachers Association

"...Whether schools decide to use CNN NEWSROOM is, of course, a local decision... we urge cable operators do their part in helping wire those schools that are not already set up for cable. We (do not) want to trade our kids for a satellite dish or a TV monitor."

Gary Marx
Associate Director
American Association of School Administrators

"We particularly applaud the focus that CNN NEWSROOM has given to each separate day, because this moves the news program available to students from simply a superficial 90-second headline to something of depth and context."

Scott Thompson
Executive Director
National Association for Secondary School Principals

On December 18, 1989, CNN NEWSROOM received endorsements from the five major educational organizations represented above. Pictured L to R: Keith Geiger, NEA; Scott Thompson, NASSP; Gary Marx, AASA; Tari Marshall, National PTA; Jeremiah Floyd, NSBA and Ted Turner.

"CNN NEWSROOM is timely, fascinating and informative. It helps students thinking critically, (to) organize ideas and better understand the connections that tie the world together."

Keith Geiger
President
National Education Association

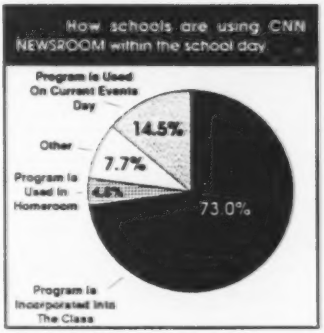
"We believe the 15-minute daily news program designed for viewing by students in the classroom adds a significant and highly useful dimension to the school curriculum."

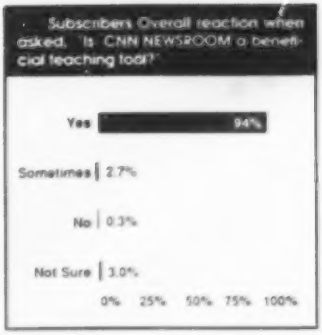
Jeremiah Floyd
Associate Executive Director
National School Boards Association

BEST COPY AVAILABLE

USER SURVEY

The following information was compiled from a random survey of CNN NEWSROOM subscribers throughout the United States, conducted from October 1989 to June of 1990.





Total Schools Enrolled in CNN NEWSROOM = 21,188

*as of 7/17/91

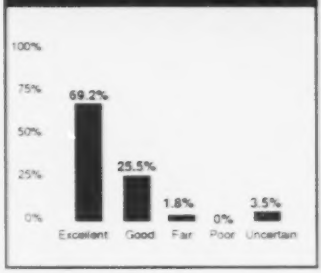
USER SURVEY

CNN NEWSROOM Enrollments By Grade Level

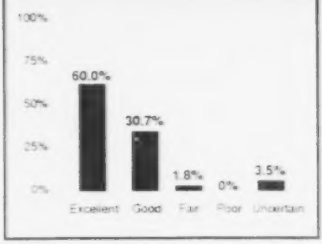
Grade Level	Schools Enrolled
Elementary	6,988
Middle	2,929
Junior	1,538
Senior	5,591
K-12	808
Other	2,149
Unknown	126
Total *	20,129

* As of 6/28/91

Teachers reactions to the quality of CNN NEWSROOM.



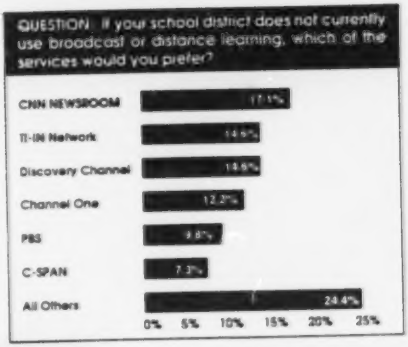
Students reactions to the quality of CNN NEWSROOM. (Student reactions based on teacher interviews.)

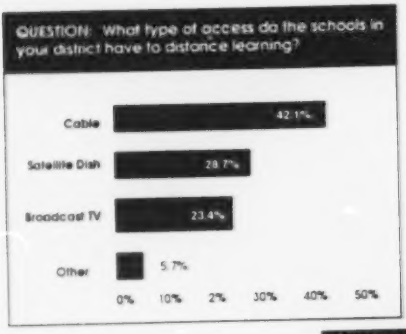


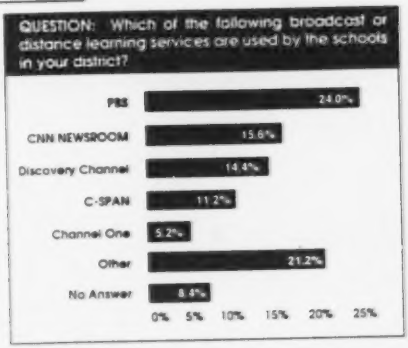
The above information was compiled from a random survey of CNN NEWSROOM subscribers throughout the United States, conducted from October 1989 to June of 1990.

THE CPN SURVEY

The following information was obtained from a research report prepared by Curriculum Product News, August 1990, following a survey of their readers. The report is titled "Broadcast and Distance Learning in the Nation's 15,000 Public School Districts."







Senator BINGAMAN. Thank you very much.

Ms. Sandra Welch, with Public Broadcasting, thank you for being here.

Ms. Welch. Thank you for asking us to participate.

My written comments have been submitted, so I will just summarize those and also perhaps provide a little bit of first-hand experience to the discussion here.

I started as an elementary school teacher in Kentucky 25 years ago, and I think my second week on the job my principal rolled a television set in and told me that there was this new thing called educational television, and they had a program on there that she wanted me to try with my students. I was very, very skeptical. I couldn't imagine how something on television could be as grand and glorious as what I could provide those kids as a teacher fresh out of college, thinking I was there to save the world for the next generation.

But I used television, and I found it to be an incredibly powerful and effective tool in motivating youngsters. In this case, it was a reading program. I have been sold ever since.

I began working in public broadcasting not too long after that, and just recently came out of one of the local stations in Kentucky, a State network, where last year we put a satellite dish on every school in the State. We equipped every school with interactive equipment, and we were one of the first Star School recipients to provide those high school credit courses, particularly in the rural disadvantaged schools in Kentucky and eventually in other States.

Let me just give you a broad overview of what public television has been doing over the past 30 years. Being of course the original educational classroom television, we today have probably the broadest scope still of any provider. We have a tremendous range of programs, and we use a tremendous number of techniques in providing resources to teachers and students. We have curriculum-specific programs that are broadcast by many of our stations throughout the country—programs in math, science, social studies, the arts, grades K through 12, that teachers use in very direct ways as they are teaching fractions or American history or dance.

We also have the new distance learning programs that you were talking with Dr. Roberts about earlier. That was one of the things I did before I left Kentucky. I found the best physics teacher we could possibly find, and I put that teacher on the air, and that teacher teaches every day in a live, interactive format, to youngsters not only in these rural schools in Kentucky, but across the country.

And of course, public television has a tremendous number of resources that you see in our prime time schedule, programs such as the "Astronomer" series that we recently aired, that is used by science high school teachers; the Civil War series, which is being extensively used by teachers in middle schools and high schools; the science programs that are in our afternoon schedule, like "3-2-1-Contact" and the math series, "Square One TV".

We have thousands and thousands of hours that we broadcast, that we deliver through satellite, that come into schools on cable and that come in on videocassette to teachers and learners, again, nationwide.

Another characteristic that distinguishes public television is our reach. We are reaching three out of four students nationally currently. That represents about 30 million students. We reach about four out of five elementary and secondary schools, and about 1.5 million teachers use our programs.

In addition to just these statistics, I think the human story is the one that means the most to me and is what we are really all about here today.

Two years ago when we were starting our distance learning effort, I went into a rural school up in the Appalachian mountains of Kentucky, a school in Knott County, Cordia High School. This is a school that is so far back you really have to make an incredible effort to find it.

I walked into this school, which is over 100 years old, built into the side of the mountain. We had a satellite dish on that school that we had just recently put on, and there were three youngsters who were taking an advanced mathematics course that we were offering. I spoke with one of the young ladies who was taking that course, and she told me that because she had grown up in eastern Kentucky, because all she had heard about was how poor the schools there were and how low test scores were of youngsters in that region, she had assumed that she could never compete with other youngsters, and there was no thought that she would ever go to college. She said, "Because of this course, I realized that I really understood mathematics, that I had ability because I could answer those questions before those kids in New Jersey could." And she said, "As a result of that, my confidence level got built up, I applied to the university, I was accepted, I've got a scholarship, and I am going to the university this fall and I am going to major in math."

That little girl 1 day could be one of our country's outstanding scientists. And that is why I am in this business, and that is why I believe that in public television we are always going to remain committed to reaching these kinds of youngsters, and we'll use whatever technology and whatever techniques are necessary to get to them.

In conclusion I just want to say thank you to Congress for funding public television's new satellite system. We will be launching the satellite—actually, AT&T will—in 2 years. It is going to have tremendous interactive capability for education, and the reason I came to PBS 6 months ago was to help public television develop those educational applications so that we can go way beyond where we are today in reaching the teachers and the youngsters of this country who need us the most and providing them the kinds of opportunities that I described that we provided this young girl in eastern Kentucky.

Following up some of your earlier questions, I too am very eager to find out about the resources and directions of the Department of Education. A group of us in public broadcasting will be meeting with Secretary Alexander this afternoon to learn more about that, and we are also meeting very soon with the staff over at the National Science Foundation, because obviously these resources should be as widely available as possible, and through public television we have and will have in the future a very extensive delivery

system, capable of making sure that these resources are widely known and widely used.

Thank you so much.

[The prepared statement of Ms. Welch follows:]

PREPARED STATEMENT OF SANDRA H. WELCH

We at the Public Broadcasting Service are extremely appreciative of the opportunity to appear before you today and discuss PBS and public television's commitment to serving the educational needs of this nation.

For more than 30 years, public television has expanded educational opportunities for all Americans, of all ages with quality commercial-free educational programming and locally responsive support services. Our commitment to education has never been stronger nor more important.

The real importance and power of public television is best demonstrated by the people who have used it to overcome personal obstacles and gain new opportunities for themselves. These people are living proof of the educational power of public television. Each of them represent millions of others in this country, in your own communities whom we can reach and teach.

Public television now operates the most comprehensive educational delivery system in the nation. Thanks to you and your colleagues in the United States Senate public television will be technically equipped to deliver interactive voice, data, and video services to help meet the education needs of the nation into the next decade.

Congressional funding has enabled PBS to purchase six transponders on AT&T's TELSTAR 401 satellite, which will begin service in 1993, and to purchase the necessary equipment to provide interactive voice, data, and video services. PBS remains hopeful that TELSTAR 401 may emerge as the "educational satellite" and become the communications hub for a variety of educational services to be offered to the education community.

Recent developments in digital video compression, which will greatly expand satellite communications channel capacity, combined with public television's VSAT (very small aperture terminal) communications network offer the potential for many innovative educational services, some yet unimagined.

We are now considering whether public television might be able to provide interactive educational programming channels dedicated to specific subjects. For example, there could be a channel devoted to basic math, one to science, another to literacy instruction, or music instruction, or teacher training. And what if every teacher and student could send and receive data nationwide using this system. We have an opportunity to develop TELSTAR into a tremendously powerful learning tool.

Over the next several months PBS and its member stations will be working vigorously to set the course for these activities and make them a reality. A major challenge for us all will be finding the financial resources to fulfill our educational mission.

PBS will use some of its limited education funds to conduct research and development activities and will be asking stations to contribute funds as well. But it will take a substantial financial investment to fund the planning, acquisition, and production of programming and supplementary teacher/student educational materials, as well as the associated operations, to assure the realization of these services. Many stations will find it difficult to even think about participating without additional federal financial support. As you are probably aware, the financial prospects of many public television stations across the country are best described as grim.

Today our broadcasts deliver an array of educational programs to 100 million children, youth, and adults each month in their homes, child-care centers, workplaces, schools, and other settings. Three out of every four students in elementary and secondary schools use our targeted instructional programs. And two out of three colleges actively use our adult learning programs, enrolling over a quarter of a million students this year alone in our courses, far more students than any other educational service provider.

In a recent study commissioned by cable television which was conducted by a professor at Columbia University, 56 percent of teachers surveyed said that public television was the source for the highest quality educational programs, followed by Arts & Entertainment with 16 percent and the Disney Channel with 15 percent. In terms of actual teacher usage, public television led with 55 percent, followed by the Cable News Network with 12 percent and A&E Classroom with 11 percent.

Our reach has grown each year because public broadcasters are delivering service to the education community and America's students not only by means of terrestrial broadcast but also by ITFS (instructional fixed television service), cable, and satellite channels, as well as by videocassette, videodiscs, and computer software.

Public television helps prepare children to start school ready to learn. Programming for pre-schoolers is one of public television's greatest strengths. For almost 25 years we have been meeting the needs of children, as we broadcast daily programs such as MR. ROGERS and SESAME STREET throughout the country, completely commercial free and available to almost all American children at no cost. Next year our preschool programming will increase with the addition of several new series: BARNEY AND THE BACKYARD GANG and THE SHARI AND THE LAMBCHOP SHOW.

We are also beginning to provide much more than television programs and are making childcare teacher guides, parent guides, magazines, and other learning materials available. Some of our new initiatives include Children Television Workshop's Preschool Education Project and South Carolina's plans for the early childhood professional development network.

Our inventory of math and science programs is unparalleled. 3-2-1 CONTACT has recently been repackaged into 15-minute programs with specialized teacher/student materials for classroom use that will become available this fall. The series FUTURES, featuring Jaime Escalante, the remarkable East Los Angeles math teacher, is successfully turning kids onto math. Ongoing prime-time series like SCIENTIFIC AMERICAN FRONTIERS, and NOVA, as well as limited series like THE SHAPE OF THE WORLD, and THE ASTRONOMERS all have excellent teacher guides, and many have student activity sheets and other materials that are being used extensively in math and science classrooms across the country.

Public television is also bringing the country's finest math and science teachers live via satellite into many rural and disadvantaged school districts. The Satellite Educational Resources Consortium (SERC) is offering calculus, physics, and advanced math courses to high school students in twenty-three (23) states.

We are also helping to train teachers. WNET's Texaco Teacher Training Institute, Louisiana's algebra series, and West Virginia's use of the MECHANICAL UNIVERSE to train physics teachers are examples of the public television's efforts all across the country to help improve math and science teachers' skills. Public television is also providing teachers with other resources such as LEARNING LINK, a computer information service that offers teachers information and help in using public television programs as well as the ability to share teaching materials and ideas with other teachers all across the country.

Public television is also helping our youth to stay in school and graduate, and our schools to be free of drugs and violence. ALL OUR CHILDREN with Bill Moyers looked at ways to help children at risk. The Public Television Outreach Alliance has spearheaded mentoring and family projects. WTVS-Detroit is a powerful example of how a public television station committed to serving its community can lead local efforts to provide its young people with opportunities to help them become successful citizens.

Public television is also contributing to the goal of assuring that every adult American is literate, through community outreach efforts such Project Literacy U.S. (PLUS) as well as the broadcast of instructional programs such as LEARN TO READ and GED ON TV. Oklahoma Educational Television just last week announced the launch of a second television service—the Literacy Channel—to serve viewers of all ages with new creative educational programming.

Public television also offers adults ongoing opportunities for education through our college programming. Prime-time series, such as THE CIVIL WAR and EYES ON THE PRIZE, were of value not only to the millions of viewers watching during prime time, but also to the thousands who were learning and earning college credits. More than 250,000 adult students nationwide earned college credits this year through our programming.

Public television also brings the issues in American education to the American public, showing how problems in education affect the health of our nation, profiling schools where change and reform are succeeding, and promoting discussion and action at the local level. For example, during the week of September 1 through 6 this fall public television will broadcast 9 hours of prime-time programming that will bring the education challenges facing the nation to the attention of viewers at home. These viewers include parents, business leaders, and government leaders. Many stations are also producing local programs and holding town meetings focusing on the specific education issues of greatest concern to local communities.

We at PBS and in public television are intent on finding solutions to the obstacles that now limit the educational use of many of the programs in the National Program Service. We have new initiatives underway to secure the appropriate educational rights to facilitate telecourse development and reversioning of programs into new forms for school use. We are also examining new ways to extend the impact of the National Program Service through distance learning.

We are also developing new strategies for producing, funding, promoting and delivering *new* educational services. My primary reason for coming to PBS was to help develop new educational services that stations can offer to local schools, colleges, businesses, and viewers.

Public television has the expertise, the technical capacity, and the commitment to enable the creation of a whole new world of educational opportunities for every American in this country. But we need your help to make that possible. If we are bold, if we are imaginative, and if we really care, public television will help make America competitive again through the educational power of television.

Senator BINGAMAN. Thank you.

Ms. Welch, I believe you said you reach 30 million students, three out of four. In what way do you reach these students? I mean, are there that many students out there who are actually taking courses that you broadcast? You don't reach 30 million in the same way that Whittle reaches 6 million. Whittle has 6 million students there, viewing their news program every day.

Ms. Welch. No, it is quite different in that our programs are made available through our local public television stations—meaning they may be broadcast by the station, they may be carried by a cable channel, they may be coming in through a satellite dish, but they are coming in, and teachers themselves are deciding which programs they want to use, when they want to use them and how they want to use them.

The reason we know that 30 million students are being reached is that we survey periodically the schools. Our member stations help conduct these surveys, and we find out that over the course of the year on the average, teachers are using some of this wide scope and range of programs. So it is not that we have 30 million enrolled in a formal high school course, but we've got 30 million students, some of whom are using our science series such as "3-2-1-Contact"; some may be using our history programs like the Civil War. That does include some who are taking the advanced calculus course that I described, and so on.

Senator BINGAMAN. But if I am that biology teacher I was talking about before, and I wanted to take advantage of something that public broadcasting is doing, do I have to first of all determine if it is going to be broadcast in the area that I live, and if it is, find out when that is and make arrangements to get the video equipment to record that and then make arrangements to get the video equipment and the TV in my classroom to show it—I mean, I've got to do all of that myself as the high school biology teacher; is that right?

Ms. Welch. As Linda said to you earlier, it can vary from place to place, but let me give you a specific example of how it worked in Kentucky.

We broadcast programs that your biology teacher would want to use, very specific programs for those biology units. We published a schedule every year that was mailed to every school, and every teacher got a copy. So you would get a copy of the schedule from your local public television station KET. There would be a section

that would say "biology" that would tell you exactly what we were going to have available and when; it would indicate that there were teacher guides for all of those lessons, and it would indicate on their if you want a guide, just fill out this form and mail it in, and we will mail you the guide back.

When you wanted to use those programs, you would check with your public television building liaison because we at KET would go into every school and say we want someone here to be the facilitator, to help teachers make sure that they have the TV set, to make sure that they either have a VCR in their classroom, or that the media center has the VCRs and will play the programs when you want to use them. Then every year we would also survey you and ask what did you think of those biology programs that we offered this year—did they really work for your kids; are they current; are there other programs that you would like for us to offer? And then the next year, we'd use your feedback to try to give you an even better service.

That's the ideal, and that exists in a lot of schools where there is as public television station nearby.

Senator BINGAMAN. But I guess I still have to conclude that in these schools, you have indicated you now have a satellite dish at each high school in Kentucky.

Ms. Welch. Yes.

Senator BINGAMAN. Does that also mean you have all the other equipment that Whittle is talking about in those high schools, and that they have televisions in the classrooms, and they have VCRs with which to record what comes through the TVs?

Ms. Welch. In Kentucky, we are probably better-equipped than many other States. I would guess that in most schools and a lot of our schools do have a set in every classroom. But then we have those disadvantaged schools that still don't have enough television sets, and overall in the country, absolutely, there are not enough television sets, and that is one of the biggest obstacles teachers face to using our programming or anyone else's programming. And that is what obviously made the Whittle program so incredibly popular with teachers. They are hungry; they are desperate to get new television sets in their own classroom and not have to share with other teachers.

Senator BINGAMAN. So is it fair to say that while the Federal Government, through support for public broadcasting, has done something to provide the resource that is needed—the Federal Government has done very little, other than through the Star Schools program in very selected places, to provide the so-called "lightbulbs" that Ms. Eshbaugh was talking about. I mean, you've got the electricity, but nobody has a lightbulb.

Ms. Welch. That's correct.

Senator BINGAMAN. And that's what Whittle is providing.

Ms. Welch. They are, and yet I think we must recognize that they have gone into 9,000 schools, and those teachers are very, very happy, but there are approximately 100,000 schools. So there are 90,000 schools that don't have a TV set in every, single classroom, or only a very few of them. So I think we really do have to think about and look at those schools that Whittle is not serving at this time that really do need that equipment as well.

Senator BINGAMAN. Mr. Rowe, as I understand what CNN is doing, you folks also are providing what you consider a useful resource, but you are doing that in the sense that you are broadcasting it through your cable system.

Mr. Rowe. That's correct.

Senator BINGAMAN. And then it is still left to the local teacher to figure out how to get the equipment to take advantage of that service and to use that service in the instruction.

Mr. Rowe. That's right. And we are finding more and more as cable operating companies have become active in this cable in the classroom effort across the country that they are taking great steps forward in terms of helping to provide schools with basic equipment where none exists or where there are hardships, to provide teacher training, resources, information about all of the programming that is available by cable. And that effort is building. It will take a while for it to penetrate every school in the Nation.

Senator BINGAMAN. But is that just that the cable companies are donating equipment to schools? Is that what you are suggesting?

Mr. Rowe. Some are, yes, and it is important to remember that all of the cable companies participating in this project have pledged free basic cable service. No one has calculated the dollar value of that service to schools, but it would be substantial across time.

Now, we do survey equipment needs in schools and what schools have. A company called Quality Education Data in Denver has been measuring these things for many years, and they are beginning to see an incredible takeoff in terms of the amount of equipment that is in schools.

The CNN NEWSROOM-enrolled schools have on average at least six VCRs and nine TV sets in the school buildings already, and that number is growing.

There is no controversy about the most successful audiovisual medium in schools, the chalkboard—they are everywhere. They were part of the old Industrial Age model of what a school needed. We are only just beginning to turn the corner and understand that what schools also need is a way to see the world through that electronic window called the TV screen.

Now, I don't think there is as much controversy about television among educators now as they are beginning to see it as a utility and will demand to have it, and we need to help them.

Senator BINGAMAN. Ms. Eshbaugh, you indicated, I believe, that your arrangement with the school districts that you have contracts which permits them to use this equipment and this network for anything that is not in competition with Channel One. Do you consider CNN in competition with Channel One?

Ms. ESHBAUGH. We do not, because while certainly their program carries an identification for CNN, it doesn't have commercials per se.

Senator BINGAMAN. So if a teacher who is in one of your schools, a school that you have a contract with, wants to hook their system up the cable and record from the cable the CNN NEWSROOM and show that, you do not object to that?

Ms. ESHBAUGH. Certainly not.

Senator BINGAMAN. OK, you don't see that as interfering. And the same thing with public broadcasting—is there any reason that anything in your contractual arrangement that keeps a school district or a teacher from using your equipment to record and play back public broadcasting?

Ms. ESHBAUGH. Not at all; in fact we facilitate that. Just to use Kentucky as an example, we currently have over 280 schools in Kentucky, middle and high schools, that are participating in our programs, which says that at least in those schools there was certainly a need for the television equipment as a resource. And certainly that facilitates the use of public broadcasting, of cable programming, and of distance learning resources.

At the beginning of last year, the Gallup organization conducted a poll of classroom teachers at the middle and high school levels, and according to that poll, 85 percent of the teachers did not have a television set in any classroom that they taught in during the course of the day. And in the larger schools, there was an even greater lack; it was up in the 90 percent range.

What we provide the schools are television sets generally in every classroom in a school. We also provide easy access for bringing a VCR into the classroom because we can have an easy connect so that the teacher can quite easily show the programming in her own classroom without having to go check out equipment and discover whether it is working or not.

We provide the equipment, we maintain it, and they have free use of the equipment during all except the 12 minutes of the day that Channel One is shown.

Senator BINGAMAN. I assume the contract that Whittle signs with the local school districts provides that the equipment is there for the use of the school as long as the contract remains in effect.

Ms. ESHBAUGH. Yes, sir.

Senator BINGAMAN. So that if in fact a school determines not to continue to show your programs, them you take the "lightbulb" away.

Ms. ESHBAUGH. Yes, that certainly could happen, although the wiring, which is of course an important component here, does remain in the school. They may continue to use the wiring, so they could in effect hook up their own televisions should they withdraw from the program.

Senator BINGAMAN. OK. Let me ask a question on a whole different sort of issue here. Is there a value or is there an appropriate role for the government in monitoring what is going out on any of these programs? Is that a concern that has been raised? I don't know. It just strikes me that, for example, if Whittle has 6 million kids sitting there watching your news program every day, I guess as a person in the political realm, I would like to be confident that the content is not biased in one way or another on major issues of the day.

What do you think the proper role of government is to assure that?

Ms. ESHBAUGH. Well, first of all, let me tell you a little bit about who actually controls the programming on Channel One. We have a very professional news staff that puts the programming together. We have various panels of educator advisors who oversee that. At

the school level, the program is automatically recorded before 6:00 each morning. We provide the school with a preview monitor so that the media librarian, the principal, or some other designated representative of the school can easily preview the programming before it is aired. And by the way, the programming does not have to be aired all at one time, although that is in fact the convenient way to show the programming.

Then finally, in every classroom there are on-off buttons, and there is a plug where the television is plugged into the wall. So in effect the programming is controlled and monitored ultimately by the classroom teacher. If she finds something inappropriate, then there is always an on-off button.

There are over 3,500 school districts that have thus far adopted Channel One, approved it for use in their schools, and in the course of doing that we personally have been involved in over 30,000 town meetings where the curriculum has been debated, where people have dealt with the question of is advertising appropriate for the schools, in public fora. So there has been a good bit of public policy input into the adoption of these programs.

At the local level, I believe that local government through the school board that has approved the programming for use and obviously is responsible to the local constituents for seeing that the appropriate things are happening in their schools are accountable there.

So in a sense this is no different than other textbooks that are adopted locally and are at a statewide level. So I think perhaps it may be helpful to view these resources in the context of other curriculum materials where State and local guidelines are really what has thus far governed rather than national.

Senator BINGAMAN. Now, taking that analogy to textbooks, I believe the arrangement in my home state in New Mexico is that textbooks have to be approved by the State Board of Education. Shouldn't the State Board of Education have to approve some way or other, or have some oversight and ability to monitor and control what is broadcast into the schools as well?

Ms. ESHBAUGH. Generally, even in those States where that may happen, schools have a lot of flexibility in terms of what they bring into the classroom as supplemental resources. This may be in the form of magazines such as *Scholastic* magazine, which also contains advertisements, newspaper in the classroom programs which are used on a regular basis in schools all across the country, and television resources.

So we would consider Channel One to be one of those supplemental resources. It crosses curricula, so it probably doesn't fit within the particular guidelines that are applied at the State level.

Senator BINGAMAN. So you don't think that the same kind of oversight is required for broadcasts that would be for textbooks?

Ms. ESHBAUGH. Well, again, I believe that this is supplemental.

Senator BINGAMAN. It supplements the curriculum; it is not part of the curriculum.

Ms. ESHBAUGH. Exactly. Now, I believe in Texas fairly recently the State board there approved the use of a software program in the science area as curriculum, so it was an entire course of study delivered via software. And I think that is a different situation,

and certainly, if software or electronic programming is being used as a curriculum, then it should fit whatever appropriate standards there are at the State level.

Senator BINGAMAN. OK. Mr. Rowe, did you have any thoughts about whether government should be doing more to oversee or monitor what is being broadcast into our schools?

Mr. Rowe. I think that the guarantor of the quality of our program is really the teacher. That is because CNN NEWSROOM does not have to be shown to anybody on any given day in a school. It is always an educator who makes the decision about what is relevant to use and what is not.

I recall prior to the launch of our program a meeting that I had with the committee of the board of regents in Albany, NY. A public broadcasting executive there literally almost pounded the tabletop as he said, "Give our kids the real news." And that's in fact what we try to do. We don't try to sort of "dumb down" the news or refashion it to appeal to younger minds. We try to exhibit the world as it is. And the guarantor for the quality of that, I believe, doesn't come from government but from the millions of citizens around the world who watch us every day and the legions of TV critics who are ready to pounce on us if we don't do the right thing.

Senator BINGAMAN. I will undoubtedly think of other questions as we get further down the road, but that's what occurs to me right now. So let me thank all of you for being here.

Why don't we just have a five-minute break before we start the final panel, and then we'll get going again.

[Recess.]

Senator BINGAMAN. We'll come to order.

The final panel includes Mr. Frank Mankiewicz, who is now vice chairman of Hill and Knowlton and has a long and distinguished career in public broadcasting of various kinds, and Mr. Gary Tydings, who used to work with me here in the Senate and is now executive director of professional engineering development and instructional television at the University of New Mexico.

Mr. Mankiewicz, thank you for coming.

STATEMENTS OF FRANK MANKIEWICZ, VICE CHAIRMAN, HILL AND KNOWLTON PUBLIC AFFAIRS WORLDWIDE, WASHINGTON, DC AND GARY TYDINGS, EXECUTIVE DIRECTOR, PROFESSIONAL ENGINEERING DEVELOPMENT AND INSTRUCTIONAL TELEVISION, UNIVERSITY OF NEW MEXICO, ALBUQUERQUE, NM

Mr. MANKIEWICZ. Thank you, Senator.

I will try to paraphrase my testimony as I go and put it in the record, if I may.

Senator BINGAMAN. That would be great.

Mr. MANKIEWICZ. What I primarily wanted to address were some of the concerns about the uses of commercial television in educational television, particularly the Channel One experiment that is one of the foci of the discussion this morning.

The question, of course, is how television can best be used, and let me say first of all that as an executive of Hill and Knowlton Public Affairs, I want to make it very clear that we have no client interest here, no dog in this fight; in fact, I have no idea who the

Channel One sponsors are and made it a point not to review the list. These are really my independent views based on my experience and judgment and not as an executive of that company.

The interesting thing, Mr. Chairman, that I think we want to look at at the outset is that young adults in the United States today know less about world affairs than probably any other generation certainly in the last half century and probably in our history. That is a very damaging assessment particularly as public affairs, world affairs, and domestic affairs become more complex. One would have thought that the trend would be in the other direction, but Americans 18 to 30 are less likely to watch news on television or to read a newspaper than their counterparts in previous generations and accordingly they are less capable of identifying newsmakers and less interested in current affairs.

The astonishing figures we saw a couple of days ago on the decline in newspaper revenues are a direct function of a decline in newspaper readership. Young people today do not subscribe to a newspaper automatically when they start a family or begin a work career, as I think they used to a generation ago. More and more the trend that Walter Cronkite noted with such unhappiness 15 years ago, when he noted that 50 percent of Americans got all their news from television, and 75 percent got most of their news from television. Those figures have gone steadily up along with a general decline in viewership. So that I think it is safe to say that more people are watching less and certainly reading less.

And ignorance combined with apathy is probably the most dangerous thing we confront. I remember a vivid description of the power of television, certainly confirmed by hundreds and perhaps by now thousands of studies that I looked at in the course of writing a book about television in 1977, was an account by Jerzy Kosinski, National Book Award winner, who spent some years as a teacher in a public middle school early in his career. He fitted up his classroom with a television monitor, and as he would speak to the children, the camera would be on him, and the children could either watch him live, or watch the monitor. And almost all of them chose to watch the monitor while he was lecturing, talking, giving examples, writing on the blackboard. Then, by prearrangement, he hired another adult actor to burst into the room, begin to argue with him, and then begin to fight with him. And they were punching each other and rolling on the floor and appearing to do considerable damage to each other. And while all this was going on, the children were not watching the live event; they were watching it on the monitor because it seemed more real to them to see it on television. That kind of example can be found in the research literature about the impact of television on young people, repeated and repeated. So that what we have is a medium of communication, Mr. Chairman, which in some instances is more real than real life itself. Now, whether that is good or bad is worth a lot of study, but it is certainly a reality, and there is a need to harness it if we are going to go to the question of ignorance and apathy that confronts us.

Educators now come to believe that reading is readily replaced, as we heard in testimony earlier, by visual techniques—a shift, perhaps, from right brain to left brain—and for reasons, really, which

can be put simply as "If you can't beat it, join it." An examination of scholarly literature on the subject 15 years ago showed such notions had been introduced in the Nation's schools in the Sixties and Seventies as a response to children whose orientation is visual. But most teachers' use of visual techniques has been for the most part limited, sometimes reluctant, but always limited by the amount of equipment available and in some cases a rearguard action against a force far beyond their control.

The editors at the *New Republic* talked about the ear of educational television in 1989 when they looked at Channel One's beginning and said: "The cheapest shot being directed at Channel One is the assertion of guilt by association with television. There is nothing wrong with using television educationally, as long as it works, and current events is probably better suited to the medium than most subjects."

Even the Children's Television Workshop, the producers of "Sesame Street", understood very early that children are accustomed to seeing commercials, and they produced "Sesame Street" in the form of a commercial television program, so that it would say, for example, this portion of "Sesame Street" is brought to you by the figure "4" or by the letter "C", and then they would give some examples of it, as though they were pausing to show a commercial, because children even at the "Sesame Street" age had been acculturated to pause in the course of learning or acquiring information in order to get a different kind of message of a commercial form.

Channel One represents in this way, I think, the best of the concepts that we have seen and examined as to how to get through to children in this age. It is not age-specific but it is informative and abundant. Children will see it, and the message will have some impact. And best of all, as your discussion with the previous witness demonstrated, they put a TV set in each classroom with a VCR, fully-equipped, so that it can go to cable, it can go to all kinds of communications methods, and the news program comes right into that classroom, and there is no question of trying to read an annual guide to see which programs one might want 3 months from now or 2 months from now or 6 months from now. The set is there, and the program is there very day. That is an enormous advantage over I think almost anything else.

I think the capture of Channel One's captive audience with a television message 2 minutes out of the 12 that the program is on is not a bad thing. It is not as though they are learning the values of satanic worship or the degradation of women or how to operate an automatic weapon. They are taking a short period out of the day to see what is happening in the country and the rest of the world, and a short commercial message as well. It is not, after all, unknown to high school students to see a commercial message.

Experiments have found that just a short, 30-second commercial selling pro-social behavior is sufficient to change children's playing habits, at least according to the expert of experts, Robert Keesham, better known as "Captain Kangaroo", whose knowledge of what children want on television is probably unsurpassed.

In addition, just to conclude, there is a series of programming worked on some years ago in the Philadelphia schools, using televi-

sion to help children not learn things that are on television as much as to read. Two educators in Philadelphia prevailed on some Hollywood producers to provide them not only with old TV shows in cassette form, but also the scripts for those programs. Then they would show the programs and give the students the scripts and allow the students to follow the script as the program was played, to read the script before the program was played, to play the parts, to be the various characters on such really rather nonlearning programs as "Gilligan's Island" perhaps, or some of the other early television staples. But the students were so eager to play a role that they would learn to read the script, and that script reading and role-playing and the use of those programs proved to be an enormously valuable tool in teaching students to read, and the increase in literacy was enormous.

So it seems to me that television in the classroom has a significant role to play. It has helped reading scores in that way. I think perhaps Channel One ought to look at the question of interaction, or the question perhaps of talking about the news program after it is on the air. The teacher, after all, has a significant role to play here. I understand a lot of schools play the Whittle Communications Channel One program in home room and do not use it as the basis for further discussion in a social studies class, which I think probably would be a good deal better. But with a good teacher, Channel One becomes a strong addition to classroom instruction, and a captivating learning tool.

Research, Mr. Chairman, indicates that the average child sees 200,000 television commercials by the time he reaches the age of 18. If that child were watching television every day for 18 years—and that is likely—that would mean an average of over 30 commercials a day. So the 2 minutes additional to which he or she might be subject in the classroom seems to me not to be a significant addition to the television diet and probably on balance even a helpful one.

There is already advertising in schools, Coca-Cola signs on the scoreboard, signs on the little league fences, donated book covers, logos. There is a lot of advertising in the schoolroom, and I think without great damage.

I think this all has a splendid potential for learning as well as profit, and I wish Channel One and its sponsors well.

Thank you.

[The prepared statement of Mr. Mankiewicz follows:]

PREPARED STATEMENT OF FRANK MANKIEWICZ

Mr. Chairman and Members of the Subcommittee,

Thank you very much for the invitation to testify before the panel this morning and to address some of the concerns about uses of commercial television in education, particularly the Channel One " experiment" we are looking at today.

I am here this morning, not so much as an expert in the field of education, but more perhaps as a former journalist, broadcaster and an author and long-time observer of ways Americans respond to television. Today I suppose we are talking about responsible use of that power—in the form of television—and its influence in helping educate young people.

I also want to say, for the record, that so far as I am aware, in my present position as vice chairman of Hill and Knowlton Public Affairs Worldwide, we do not have a "dog in this fight," nor any client interest. In fact, I specifically made a point *not* to review a list of Channel One sponsors. Instead, I want to give you my inde-

pendent views, those views based on my experience and judgment, and not that of Hill and Knowlton nor any other corporate or business interest.

According to a recent study I recall commissioned by Times Mirror, the company that publishes the *Los Angeles Times* and owns several other media outlets, young adults in the United States today know less about world affairs than any other generation in the past half century.

Americans 18 to 30 are less likely to watch the news on television or read a newspaper than their counterparts from previous generations. Accordingly, they are less capable of identifying newsmakers, and are less interested in current affairs.

The authors of the study appropriately named their work "The Age of Indifference." They might have called it "The Age of Television."

Knowledge of current events and hard news often spurs curiosity in a young mind, acting as a catalyst for more learning.

On the other side, ignorance *combined* with apathy is always a dangerous thing. Such an appalling ignorance of world affairs could cost us what remains of our preeminent leadership position.

A blackboard and a piece of chalk will not always make an impression on teenagers today. Why not make use of every modern tool at our disposal?

None of these conclusions, I admit, are particularly new nor wholly original. I did, however, co-author a book over 10 years ago, *Remote Control*, to raise some of the issues concerning the place television plays in our lives.

Many of the instances I recounted in *Remote Control* in 1978 may be applicable to Mr. Whittle's advances in classroom education. Let me cite one fascinating anecdote about the perception children have about TV:

"National Book Award winner Jerzy Kosinski recalls . . . one of the experiences he had while teaching public school. Kosinski invited a group of 7-to-10 year olds to sit in a large classroom and hear him tell a story. The room was equipped with television cameras and monitors so the children could either watch him or see him on television. Suddenly, by pre-arrangement, another adult burst into the room and started to argue with Kosinski, pushing and hitting him. A third camera recorded the children's reactions. Not one child voiced a protest, and only a few watched it really happening. The rest kept their eyes glued to the television monitors."

What this says to me is that we have developed a medium of communication which, in some instances, is more "real" than real life itself. Whether this is a good or bad thing, it is reality.

Why not face up to it and find ways to harness it? I am not suggesting television programming as the sole means of education any more than Mr. Whittle is. I do, however, see substantial merit in the use of television as an educational supplement.

The steady decline in test scores has been countered—in the past decade—by changes in the direction of teaching children based on aural as opposed to written techniques. In other words, teachers have frequently adapted their classroom techniques in order better to reach a student body trained since its earliest days to pick up messages and information from what is *heard* rather than from what is read. . . . Why would educators come to believe that reading is ready to be replaced by *visual* techniques? For one reason—put bluntly—if you can't beat it, join it. An examination of scholarly literature on the subject 15 years ago should such notions had been introduced into the nation's schools in the 1960's and 1970's as a response to children whose orientation is visual. But most teachers' use of visual techniques has been, for the most part, limited and reluctant, a rear-guard action against a force far beyond their control.

It is time to take the fear out of educational television. The editors at the *New Republic* put it simply in 1989, when they looked at Channel One's launch:

"The cheapest shot being directed at Channel One is the assertion of guilt by association with television. There's nothing wrong with using TV educationally, so long as it works, and current events is probably better suited to the medium than most subjects."—*The New Republic*, April 10, 1989.

How has television been used so far in education? Those with children or grandchildren know well the benefits of public television's Sesame Street and Mister-ogers. We have seen first hand that televisions can be used for instruction—and learning—at very young ages.

From the outset, Children's Television Workshop planners decided to model their program after patterns already embedded in the minds of the members of the Television Generation by the commercial networks and their advertising clients. "Why shouldn't teaching be done with the sophisticated and entertaining techniques of commercial television, especially the commercials?" asked Ms. (Sesame Street founder Joan Ganz) Cooney. The chief academic adviser, Harvard education special-

ist Gerald S. Lesser, explained that CTW decided to take advantage of commercial market research on what holds children's attention, "Change of pace and style, catchy jingles and rhymes, broad comedic devices, and short, simple, straightforward presentations."

Channel One represents, in many ways, the best of the concepts I have described. It is not age-specific, but it is informative and abundant—children will see it, and its message will have some impact.

This is why I think the capture of Channel One's "captive" audience is not a bad thing. It is not as if they are learning the values of Satanic worship, the degradation of women or how to operate an automatic weapon. They are taking a short period out of their day to see what is happening in our country and the rest of the world, and that can only be a positive development.

Sesame Street and its sister and offspring programs are not the lone pioneers in the forefront of children's educational television. Consider the excellent work of Fred Rogers, a pioneer all of us so-called experts point to:

He is the example most cited when educators and child specialists argue that the power of television should neither be cursed nor ignored, but turned to pro-social purposes. Experiments have found that just a short 30-second commercial "selling" pro-social behavior is sufficient to change children's playing habits. Robert Keesham, better known as the ageless Captain Kangaroo of CBS, feels that the medium is the most potent home molder of children. The right children's programs, he says, could "change the face of the earth."

Will Channel One change the face of the earth? Probably not, but it may make our corner of the earth a slightly more informed place.

Channel One is not about educating little children, though. It is about teens in our school system. Here are some examples of successful predecessors in the 1970's:

An exciting idea was worked out by Philadelphia Superintendent of Schools Michael Marcase and his colleagues Bernard Solomon and Michael McAndrew. The educators edited the film, "The Vanishing Shadow," a 1934 movie matinee serial, interposed slow-motion and stop-action sequences, voice-overs, and superimposed words. A television station in Jacksonville, Florida made it into a television series, then—and the episodes were broadcast nightly on a regular commercial channel for 3 weeks during the school year in Jacksonville. Students were instructed to take their scripts home and follow along, reading as they watched. The next day, the class discussed what happened in the episode the night before—and the next evening's script was ready in the classroom.

"Dr. George Mason, of the English Department of the University of Georgia, surveyed the Jacksonville teachers involved after the first 3-week program was broadcast. The teachers reported "real and significant" increases in the students' vocabulary and an enhanced student interest in reading. Moreover, shy children who had never previously volunteered in class now began to step forward. Some former D students became the best readers in class . . .

"The Vanishing Shadow is not alone, although it seems to be the first to combine classroom discussion, reading, and home viewing of television in any systematic way. Another concept suggested and inspired by Drs. Marcase, McAndrew, and Solomon is the use of videotapes and scripts of programs like Gilligan's Island, The Rookies (an urban police program), and Kung Fu (a sort of Confucian Western, with police action overtones) in the classroom. If the classroom has a television monitor and video cassette player, the students watch parts of the program; are instructed to read along with the script; to act out the episodes after viewing it, using the script for that purpose; or use the script to produce their own version of the scene or the entire program, and then observe how the "real" actors dealt with the words on the printed page.

"Even educators who consider this use of third-rate commercial programs to be at best "gimmicky" have been forced to admit that the technique helps significantly to improve reading scores. Public schools in Mount Vernon, New York, for example, used these programs for 5 months, and then tested 28 students to determine the impact. Nearly 90 percent showed marked improvement in reading skills and more than half of the students gained *2 years or more* in reading levels in the 5 months that this "third-rate" television had entered the classroom. The program helped good readers as well as poor ones. One student's reading level rose four grades during the 5 months. In Philadelphia, where the program originated, reading levels of minority students were raised from low percentiles to the national norm."

Here perhaps is where I would find Channel One's deficiency a lack of participation and interaction. I understand there is a quiz at the end of each show—immediately after the dreaded commercials—but it is impossible for a television anchor to lead a discussion about what the students have seen, and the discussion may be the

most important part of the current events lesson. What if the subject needs a better explanation? What if one kid just doesn't understand?

That of course, is when we have to rely on the old stand-by—the teacher. On it's own, Channel One is 10 minutes of news and 2 minutes of commercials which a child must sit through. With a good teacher, Channel One becomes a strong *addition* to classroom instruction and a captivating learning tool.

Imagine the subjects a room full of 10th graders could broach if you gave them the basic facts. Imagine the minds that might be touched for the first time. The upside of this concept is an informed youth. The downside is another pair of athletic shoes sold through the classroom. Is that so bad?

One word about the advertising: Reliable research indicates the average child is exposed to more than 200,000 TV commercials by the time he or she reaches age 18.

If a child were to watch television every day of his or her life for 18 years, and that is likely, that would mean an average of over 30 commercials a day. Two more minutes probably will not cause many brains to crumble.

Remember, there is already advertising in schools—Coca-Cola signs on the scoreboard, donated book covers featuring company names and logos and emblems of school equipment and supplies (IBM computers, a Rawlings baseball glove carries six or seven messages).

In my opinion, this has a splendid potential—for learning as well as profit—and I wish Channel One, and the children, every success.

Senator BINGAMAN. Thank you for your testimony.

Gary, why don't you go ahead?

Mr. TYDINGS. Thank you, Mr. Chairman.

I welcome the opportunity to talk about this important issue of technology in the classroom. I think you have seen through previous testimony there is plenty of stuff out there, and there is a lot of vitality to it, and there are a lot of different options that are available.

I will come at from just a little bit different perspective as an administrator of a program, and as in the case of a lot of States around the United States, a lot of instructional television is university-based toward the public school. That is the case in New Mexico. The public television stations are licensed by universities and are responsible to boards of regents.

That is the case at the University of New Mexico. It is a co-licensee of both the University of New Mexico and Albuquerque public schools.

The university operations an eight-channel ITFS system, which is Instructional Television Fixed Service, and it is a technology that is designated by the Federal Communications System for educational programming. It is a closed system. It is addressable, very similar to what a cable system has. The university offers about 50 to 60 live classes every semester for credit, mainly in the engineering, math and science fields, geared toward worksite delivery, and we have about 600 students. In addition to ITFS, we use satellite and fiber optic cable. So we use a mix of technologies. I am a firm believer and have learned through experience that educational technology works best when it is sort of totally transparent and does not get in the way of the learning process at any point in time.

We have several pretty successful programs using various technologies. I think because it has been established, and these are live and interactive—these are live classes that are taught real-time and delivered to worksites where not only do the students out there have the ability to tape the material and review it at their leisure if they happen to miss the lecture—because this is worksite

delivery, and a lot of people do travel—but they do have the opportunity through an audio interaction to talk to the professor in real-time.

Our system has been in existence since 1985, and we have found that people had a reticence to interrupt a professor while he is doing a lecture, especially in these technical areas, but now we have found after about 5 years that they chat a lot. There is not only housekeeping going on, but there is a true interaction between the professor and the students out there, of which there can be as many as 30 to 40 different students scattered over various locations. In some cases, we go over to eastern Arizona and southern Colorado, including the State of New Mexico, with some of this material.

We found it is a viable tool in providing and consolidating very, very scarce resources. As you well know, in New Mexico, we have a finite amount of money and a finite amount of resources that are available for education, and we need to maximize those. We found that instructional television is a great maximizer of those resources and being able to put those resources where they are needed. You are able to tap the expertise of various institutions and combine them all into one sort of mix and use technology as a deliverable.

I'd like to expand the definition of instructional television just a little bit to make it include I guess the word would be instructional telecommunications, because it is in the public schools and in the universities that are providing this material a mix. To be successful, it is a mix, and it combines both the computer technology and television.

There was testimony earlier about what the NSF is doing and mention was made of this computer network. They have funded a thing called SISCONET, where there are science teachers scattered around in various locations, and they have access to some databases. That is one area where the NSF specifically has played an important role.

The Department of Interior and the BIA have funded something called BIA-NET, which connects contract schools in Arizona and New Mexico to similar-type data access and similar-type databases. It is used primarily for not only instructional purposes, but teacher and service kinds of activities and just general information-sharing amongst these schools.

As an administrator and as a former public school teacher who used technology—and I will sort of echo what Mr. Mankiewicz said. I had a similar kind of experience. I was a 9th grade teacher back in the early Seventies when technology was really pretty primitive. But I conned the school principal into letting me buy, with some funds, an old black and white Sony video camera and a video tape recorder, an old reel-to-reel.

I set it up in the classroom, where I had some very bright students on one side who wanted to create plays and things like that, and then I had some other students who weren't too interested in doing too much, as is the case with about 70 to 80 percent of your class that you usually have in a public school classroom.

So I tried something, and I tried it for about 3 weeks. I turned the camera on, and I put it on a book, a short story. I had an overhead shot of the camera; it was just on a piece of text. And I had

one of my students who was willing to do it, turn the page at various intervals, and they would turn the page. If somebody was missing, they'd say, "I didn't read that yet." I put purposely the slow readers and those who weren't too terribly interested in reading, period, watching the monitor. They had the option of either looking at the text and reading the story, or looking at the monitor. Well, most preferred to look at the monitor, and it was a very passive kind of thing other than, "You turned the page too fast."

So we went through this whole process, and then I gave them a little test after they read it—it was just a short story. Up to this point they very seldom could ever tell me 1) what the story was about, 2) who the characters were—basic questions, just basic questions about any kind of piece of literature.

Well, these guys read it; they could answer the simple questions about text—who was in it, what was it about—so I just kept it up with them for about 4 weeks. In fact I decided to take it through the entire semester. I just used this little experiment. There were about five students who sat over in a corner every time we had reading, and they watched the monitor and read this book.

I don't know—I don't have any empirical results—although I do know they could answer questions about the text, and they did read, just by taking it from one medium and putting it in another. It's because that is what they are used to now.

I think the future is real bright. I think New Mexico and a lot of States are wrestling—and I think Ms. Welch, doing what she did in Kentucky, probably has a real good grasp of how States have to wrestle with this kind of thing—because the Federal Government, quite frankly, has not taken—a very active role, it is a very disparate effort—there must be five or six different agencies that are involved in one way, shape or form. And I noticed that nobody even mentioned today the DOE and the DOD and their involvement with public schools, especially in the areas of math and science education. In New Mexico because of the DOE presence, we are heavily involved with them, and the two national laboratories that are based in New Mexico have very extensive programs and are getting more extensive.

In all the Albuquerque high schools now there is an advisor from Sandia National Laboratories who is essentially a science advisor. This is a resource person that these schools can go to. In addition to that, the two labs are very firm believers in technology and have provided impetuses, which brings up the whole question of partnerships.

What are the mechanisms that are available? That's why Whittle Communications is so attractive. It creates a mechanism to get equipment. The Department of Energy evidently is very willing and able to provide equipment and is seen to do so in some instances.

Public broadcasters have to deal with innumerable agencies in order to get money sometimes. If you want educational programming, you go to the department of education; if you want to buy equipment you have to go to the Department of Commerce and the Federal Communications Commission to get permission to license that equipment. There is no real sense of coordination involved in this whole thing.

I guess if I were asking something of Congress—and I would echo your words that you spoke earlier—I think that technology is not going to go away. In fact it is going to become a prevalent part of the educational environment. We are going to be involved in an experiment next year where it will be work station to work station, whether you take a digital signal and you send it up on a satellite, or you can send it on fiber optics—it doesn't really matter—and people will be sitting at a work station and are not only going to have instructional television with a professor right there—in multiple locations; it doesn't really matter how many you go to just so they are all hooked up and they can receive this signal—but they can send out real-time computer information, both text and graphics, and the students out there can sit at their little work stations and manipulate this stuff in real-time and send it back, and the professor can critique it in real-time.

You are talking about sending data at supercomputer speeds. It is an incredible thing, and it is going to be here. The technology is here. It has been here for 20 years. And I think that what you've got here is a real opportunity with Congress to focus a national debate. But I think it is real important, as you an see, that this has been a grassroots effort.

There are a lot of good models out there that Congress can use to focus on, and I would encourage you to—I don't think the debate today is over Whittle Communications and whether it is a good idea to run commercials or whatever in a classroom, or Turner Broadcasting and whether they are providing the same kinds of materials. I think that is almost immaterial to the debate. It is part of the picture, and it should be looked at as part of the picture.

I think too many times decisions involving technology in the classroom are done at a higher level, and teachers have no input into it. I can give you examples of where there are closets full of VCRs and computers sitting in places where they ordered them, they delivered them, and the teacher just throws up his or her hands and says, "I'm not going to use this stuff. Forget it."

There is this piecemeal approach. There is no coordination. I would urge and encourage Congress to look at a national debate that would look at the role of coordination. As previous testimony pointed out, there is no coordination, there is no ready access to this information, this material.

We are going to have technology. What are we going to do with it? How is it going to be integrated into the public school and the university environment to maximize it? That's why there needs to be a national debate on this particular issue, and I certainly encourage the committee and Congress to look at this public policy issue and to hopefully develop some redirection of resources to assist schools and universities to do this.

Thank you.

[The prepared statement of Mr. Tydings follows:]

PREPARED STATEMENT OF GARY TYDINGS

Mr. Chairman: Thank you for the opportunity to testify on the important issue of technology in the classroom.

Also, this gives me the opportunity to highlight what is being done in the area of instructional television in New Mexico and to discuss the positive elements and the problems associated with the technology.

I have been involved with instructional television for 15 years both as a classroom teacher and an administrator of an ITV program.

The University of New Mexico operates an eight channel ITFS system and uses this technology along with fiber optic cable and satellite to deliver credit and non-credit classes. Currently the university offers 50–60 for credit classes leading to degrees, per semester in engineering, math, sciences, public administration, law and nursing to over 600 students in New Mexico, eastern Arizona and southern Colorado. The system utilizes one-way video and two-way audio for delivery.

UNM and New Mexico State University in Las Cruces, New Mexico, share common courses in an innovative Masters Degree program in Manufacturing Engineering and another program offers certificate courses in waste management. The latter includes classes from New Mexico Institute of Mining and Technology in Socorro, New Mexico, and is delivered via satellite and fiber optic cable. These programs utilize the expertise of three institutions and two national laboratories and consolidates them into one program. UNM is also a member of National Technological University which is a consortium of 35 universities offering Masters degrees delivered via satellite to over 300 organizations, businesses and government sites nationwide.

In the non-credit area, UNM is producing two video conference series which provides training in the areas of Total Quality Management and Hazardous/Radioactive Waste Management. These series are received nationwide via satellite by 100 sites and approximately 2000 participants per program. The latter series is produced with a consortium called WERC (Waste Management Education and Research Consortium) and comprised of UNM, NMSU, NMIMT, Los Alamos and Sandia Laboratories and US Department of Energy.

This is the third series we have produced and we have found it a very effective way to train people on specific topics.

Other university activities in the state are with Eastern New Mexico University in Portales where they use open broadcast and ITFS to deliver classes to Hobbs, Roswell and Clovis, New Mexico, primarily in business and education.

Luna Technical Vocational Institute in Las Vegas and San Juan College in Farmington, New Mexico have received permission or have built ITV facitities on their respective campuses and will begin programming to business and public schools this fall.

The public schools in New Mexico are involved in distance learning in two areas; computer assisted and ITV.

Twenty-five school districts are participating with the TI-IN network which offers classes in languages, reading, math and science K-12, plus inservice training for teachers. This material is delivered by satellite or through local cable television systems. It uses one-way video and two-way audio, fax and computers to communicate.

In the last 2 years three small school districts in the eastern side of the state have been connected with a two-way video fiber optic cable provided by a rural telephone cooperative. This allowed a teacher in one district to teach and see the other students in the other two. This is based on successful models in the midwest among small schools facing consolidation in order to preserve the school. This year Clovis Community College and two additional districts will be added to the system.

For the past 5 years computer networks have provided access to instructional aides, inservice and knowledge sharing among New Mexico's science teachers and students. Recently, a network connecting BIA schools in New Mexico and Arizona has been established which allows access to various data bases for instructional and informational purposes. Through an organization called Technet, all school districts in the state will or now have access to several on-line data bases, e-mail, library card catalogs for instructional or informational activities.

All these vigorous distance learning activities have been initiated and sustained by a combination of grants, gifts, internal funds or self-supporting programs with no systematic coordination by the State.

For the past 4 years it has been my pleasure and frustration to be involved in a statewide planning effort to develop and construct a statewide instructional telecommunications network. The group is composed of business, the federal laboratories, military establishments, public schools and post secondary institutions. In 1988 a needs based plan was submitted to the State legislature for funding. It is still under discussion.

In the past year, US West, the principle telephone company has begun construction of fiber optic based network connecting all post secondary schools with video

and data capabilities. They are working in conjunction with the other carriers in the state to provide connectivity.

It appears that the future is bright for a statewide network using a mix of technologies to deliver instructional material to the schools, the worksite or wherever it is needed.

It has become apparent to me over my years of involvement in instructional telecommunications that to be successful, a need must be there and the appropriate technology used to fill it, not the other way around.

Too many people become enamored with the mechanics of what it will do and forget there are students and teachers at the other end and it may not meet their need or it is too hard to use. It needs to be totally transparent and not inhibit teaching or learning. Most teachers and school districts have not effectively integrated ITV into their curriculum, either through lack of funds, time or difficulty in operating it.

The need, especially in rural, underserved and geographically dispersed states such as New Mexico, for access to this material is not questioned. TI-IN and others have a large and enthusiastic student base. These students are truly motivated because they can not get these classes any other way. The students UNM deal with are the same way about the access to these programs at their worksite.

As an educator and administrator, I would encourage the Committee to explore these areas and assist in providing the answers to some questions.

The technology is becoming more and more sophisticated. UNM will be involved in a workstation to workstation, two-way video, audio, and data being delivered at rates almost supercomputer speed allowing real time manipulation of graphics and text. Where is the application of this technology except in the very technical fields and who can afford it and operate it easily?

The students that are using this material and taking these classes are highly motivated to succeed. What about the other 80-90 percent of the students that this material was not designed for, what can be done to use technology to assist them? As a former teacher, I had to spend most of my time with this group. The same techniques used to motivate them could be integrated into instructional design for ITV programs.

What is being done to assist schools and teachers to integrate this material fully into the curriculum? Too many times a decision to use ITV is done at the administrative level with no input from the teachers. That often results with the technology never being utilized.

The final element is funding for the necessary training and the hardware to support the instructional effort. Most schools, as I mentioned previously about New Mexico, do not have the money. That is why programs such as what Whittle is providing are so attractive. It provides them with the necessary hardware to access the material but it lacks the support system to fully integrate it into instruction. You are left with a piecemeal approach. Where within in the government could funds be redirected to assist in solving this need?

ITV is a wonderful tool, in the last few years it has shown and subsequent evaluations prove that it can be as effective a learning mechanism as being in the classroom. It, however, should only be viewed as one more effective way to share educational RESOURCES and maximize their impact on students.

I hope the Committee will examine these issues presented today and develop them into effective public policy and priority legislation.

Thank you.

Senator BINGAMAN. Thank you very much.

Mr. Mankiewicz, let me just ask you this. A book I read some time ago struck me as a very insightful document. I think it was by Neil Postman up at Columbia, and it is entitled, *Entertaining Ourselves to Death*—but I may have the title wrong——

Mr. MANKIEWICZ. No; I think that's right.

Senator BINGAMAN. Well, as I recall his message, it was basically that the level of public discourse on a lot of important issues has been substantially debased because all of our news comes through the television and is essentially much; that what used to be real issues and the joining of real issues in public debate, in newspapers, or however, has been replaced with a very saccharin kind of

news reporting, which is really aimed at the lowest common denominator.

Don't we have a danger, if this is a valid concern, which it seemed to me it was, that by now having essentially news programs beamed into all of our schools and delivered to kids as part of their—maybe officially, it is not part of the curriculum, but if you have to sit and watch it every day, it is pretty doggone close to being part of the curriculum—isn't there a real danger that that's what we're going to wind up with, even more of that?

Mr. MANKIEWICZ. I think that's a very real danger. In fact I would hope that if there is going to be national debate on these issues that that is the issue that will concern us, which is to say the fact that public discourse and the discussion of public affairs, whether it is at the school level or at the posteducational level, or even on the floor of the Congress, is increasingly, as you say, denatured, it is increasingly blended, it is bland, it is short. It is at best, according to the producers of it, entertaining and controversial perhaps to the point of violence, and very little informative; I agree with that, and I think Postman's book and a companion book in which he says that television has in a sense ended childhood and has made children adults too early because there are no mysteries—those are serious questions, and the obvious answers from those questions should not be used to keep television out or to make it less of a part of the educational process because it is here, and there is no way to avoid it. We are going to see soundbites. We are going to see great public questions reduced to yes and no, good and bad, black and white, 30 seconds, 45 seconds for an in-depth report.

The problem is not, I think, Mr. Chairman, to eliminate that and to get back to a time when Mr. Lincoln and Mr. Douglas could spend four hours each entertaining and informing an audience who sat in the sun and listened to them and perhaps took notes. That's not going to happen. The problem is how to take the enormous impact of television and what it has done to us. There are studies that show that within a few months of birth children are attracted to television and the flickering light, the screen, who obviously have no sense of what they see on there, and that we are becoming increasingly visual image-oriented.

How do understand that, live with it, and yet expand the educational process and the public affairs discussion, I don't know how to do it, but I know that you can't simply say it is television that has become the great cuisinart of public affairs, blending everything to the point where there are very few distinctions, and it can all be swallowed easily. You can't simply say let's do without television; let's have serious reading in the classroom.

Senator BINGAMAN. On the general subject, technology—I think everybody said today and long before today that technology and this telecommunications technology has a tremendous capability to assist us in education. Would you agree with my conclusion that the Federal Government has totally dropped the ball in providing support for the use of technology throughout our school system? We've got a weird circumstance here where we've got all this great capability that we love to allude to, but from the point of view—I always enjoyed that story about Robert Benchley, when he was a

student at Harvard, one of the exam questions was "Describe the North Atlantic Fishing Treaty and its consequences." He knew nothing about the subject because he hadn't read the textbook, so he said I prefer to approach this from the point of view of the fish, and he wrote an exam answer from that point of view.

From the point of view of the "fish", meaning the student, and the teacher, most of this great capability is just a pipe dream, it seems to me, because there is not the equipment in our schools and there are not the resources available and the instruction of the teachers available and the training to use these technologies.

It seems to me that there has been a great lack of leadership by the Federal Government in this respect. I'd be interested in your views and then Mr. Tydings'.

Mr. MANKIEWICZ. I agree with that. We began 25 years ago spending an enormous amount of money in elementary and secondary education at the Federal level that we had not spent before—had not thought it was a Federal problem.

I don't think there are very many people who would say that all those billions of dollars have improved public education at the elementary or secondary level, and yet there is this incredible world of technology that we have heard described here—but it is not in the classroom, and if it is, it is improperly taught or it is inadequately taught, because the government, which is really the only place where this coordination can take place, has not developed a systematic program of providing this kind of technological availability to the classroom and the training of teachers and other personnel to make use of it.

There are extraordinary things going on in the world— the computer, the satellite, the fax machine, all kinds of things that we understand and use a lot, plus all of the new techniques and the things that were made clear today that telephone companies may be providing us within a year; astonishing access to information. These things are not available in the classroom, and that is where they ought to be, under the control and the administration of people who are trained to do it.

The Whittle company puts a television set in every classroom. Nobody has done that up to now. That's not so much a credit to the Whittle Corporation, although it certainly is, but a reproach to our educational system.

Senator BINGAMAN. Gary, did you want to comment on that?

Mr. TYDINGS. Yes, just very briefly. I would say—and again I will be a little anecdotal and use my brother, who is a public school teacher and has been for about 15 years. His comment to me has always been, "Gary, this is all wonderful, but if it is not user-friendly, and I cannot use it readily and easily, I'm not going to use it; I don't have time. And not only that, but we don't have enough money to buy it." End of story.

Senator BINGAMAN. On this issue of helping teachers to know how to use this and to integrate it into the curriculum, is there a need for some national effort to do that? I mean, if in fact the Federal Government is broadcasting a lot of information which we claim is useful, we don't seem to be helping schools to obtain the necessary equipment to use that information that is coming across, and we also don't seem to be helping teachers and school adminis-

trators to know enough about the value and capability and opportunity that comes with that technology to take advantage of it. Is there a teacher training need here that is going unmet?

Mr. TYDINGS. Oh, huge. I would say that it is unequivocal. I guess to oversimplify, and certainly not being flippant, is the fact that if you gave every public school teacher in the United States, one, access to this material in a readily available manner, plus you gave them two hours of release time a week to learn how to use it, you would probably solve a lot of problems. That is reality. It is wonderful that there is a television set in the classroom, and most people because they have them at home can use a VCR. But when you try to integrate the capabilities of that technology and other technologies as well into the curricular effort, there is no training—none.

Senator BINGAMAN. Mr. Mankiewicz?

Mr. MANKIEWICZ. I would answer it with another set of statistics. Since 1960, the early 1960's, a time when the first generation of Americans, teenagers, who could take the SATs had been raised on television—in other words, the first generation of television-raised American youngsters began taking the SATs—from that time on, the SAT scores in the country have gone steadily down. Urban, rural, black, white, it doesn't seem to matter what groups, socioeconomic status or geography; the scores have steadily gone down because the SAT is basically a reading comprehension test.

That should tell us something, but at the same time, IQ scores seem to have gone up, so that American teenagers may be far less literate in the last 25 years, but may be more intelligent. In other words, they are picking up information not from reading but from the other great source of information, which is the television set. To ignore that event, to ignore those trends, could be fatal.

It is not to say we should replace reading with television, but we should understand that there are ways in which young people acquire knowledge now, and we ought to be able to use that not to "dumb down"—as one of the panelists said—the information, but to sharpen the way in which information is presented in both ways.

Ted Koppel had a marvelous television show about a year and a half ago, one of his specials called, I believe, "Revolution in a Box", in which he talked about the uses to which the new technology is being put almost casually in a political way. He said that people can bring down a government with an uplink and access to a satellite, an uplink, a xerox machine, a fax machine—that these technologies leap over borders now and leap over ideologies and leap over governments. That is all true. And if we can do that we ought to be able to not just teach kids to read, but build on the fact that there are now other ways besides reading to acquire information—and to reinforce the reading, of course.

Senator BINGAMAN. Gentlemen, I appreciate very much your being here and testifying. I think we have covered some good ground.

I gather that Senator Pell and also the State superintendent of public instruction in California, Bill Honig, both have testimony that they wish to submit, and I'll include that in the record.

[The prepared statements of Senator Pell and Mr. Honig follow:]

PREPARED STATEMENT OF SENATOR PELL

At the outset, I would like to commend Senator Bingaman for holding this hearing to examine the use of television in the classroom. All too often as we rush forward to embrace new technologies, we rarely step back to evaluate their effectiveness in practice. I therefore look forward to today's discussion.

Television is not new to the classroom. As far back as 1958, the National Defense Education Act, our response to the Sputnik Launch, brought the latest technology to bear upon math and science education. At that time—remember it was 1958—the latest technology was television. Unfortunately, many of those televisions were eventually stored in closets. Inadequate programming and teacher training made them essentially useless.

Since that time, however, the use of television has improved dramatically and has become a much more commonly used educational tool. Television offers visual access to worlds, cultures, ideas and concepts that many students would never have the opportunity to see. We should make every effort to capitalize on this opportunity. But we should also learn from our mistakes in the 1960's.

We must insure that teachers are able to provide students with a cognitive connection between what they are viewing and the regular academic curriculum. Otherwise television will be unable to meet its potential of having a significant impact on the learning process. It is therefore with this in mind that I look forward to the remarks of our witnesses this morning.

STATEMENT ON EDUCATION AND CHANNEL ONE

By Bill Honig, Superintendent of Public Instruction

Mr. Chairman, thank you for the opportunity to comment on the participation by public schools in programs, such as "Channel One," which use curricular time for commercial purposes.

Whittle Communications is aggressively marketing "Channel One" in the public schools. Whittle offers schools equipment, such as a satellite dish, television monitors, video cassette recorders and equipment maintenance in exchange for a contract guaranteeing that a specified percentage of students (as many as 60 to 70 percent) will watch the "Channel' One" program at the same time every day without any interruptions.

The "Channel One" programming includes commercials, in addition to news and public affairs , as an integral part of the broadcast. Teachers are not allowed to schedule the timing of the program to complement planned instructional activities or to interrupt the broadcast for discussion.

Teenagers are a significant force in the marketplace. They are impressionable and form loyalties to commercial brands on the basis of advertising. Parents entrust their children to our public schools, "Channel One" is a commercial transaction that violates this trust. We have no right—legally or ethically—to sell access to our students by converting the educational purpose of school to a commercial one, even if schools receive a modest benefit in return.

A recent study, which surveyed over three thousand students at fifty-one schools (Tuning In On Current Events, Southeastern Educational Improvement Laboratory, March 15, 1991), reports that "students believed that schools implicitly endorsed the advertisements on video news programs" and tended to believe that the products advertised were good for them. In the advertising industry, the easiest way to win respect for a product is to present it in the context of something which already commands respect. The school is a powerful symbol for the adolescent and a commercial message gains respect because the schools present it. Schools that participate in the "Channel One" proposal are, unwittingly, endorsing the commercial products included in the program.

The "Channel One" proposal also suffers from another policy defect. It cedes control of the curriculum to an outside party which is not primarily interested in educating students but in selling advertisements. We should take seriously the sanctity of what we teach and not condone surrendering the curriculum for even a few minutes a day to a commercial or political interest.

The use of news programs in the classroom is a promising idea, but only if teachers actively incorporate the material into the curriculum and use it as a basis of discussion. The stringent programming and the controls on viewing that Whittle Communications imposes, seriously dilutes any academic value of the broadcasts and, in essence, allows them to dictate part of the curriculum. Luckily, non-commercial news programming alternatives are available to schools. Broadcasts like Cable News Network and the Discovery Channel are producing commercial-free news and

informational programs especially for students. Teachers determine if, when, and how, these shows should be used in their classrooms.

The role of classroom TV should always be controlled by the teacher; the medium should never control the teacher. I urge the Committee to reject any attempts by Whittle Communications to have the Congress support the proliferation of "Channel One" in the schools.

Senator BINGAMAN. We hope to have another hearing on this same set of issues sometime in the future, but I think this laid a good groundwork for some of the things going on, and I appreciate your being here.

Mr. MANKIEWICZ. Thank you, Senator.

Senator BINGAMAN. Thank you very much.

The subcommittee stands adjourned.

[Whereupon, at 11:10 a.m., the subcommittee was adjourned.]

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